

\* \* \* \* \* Welcome to STN International \* \* \* \* \*

NEWS	1			Web Page for STN Seminar Schedule - N. America
NEWS	2	NOV	21	CAS patent coverage to include exemplified prophetic substances identified in English-, French-, German-, and Japanese-language basic patents from 2004-present
NEWS	3	NOV	26	MARPAT enhanced with FSORT command
NEWS	4	NOV	26	CHEMSAFE now available on STN Easy
NEWS	5	NOV	26	Two new SET commands increase convenience of STN searching
NEWS	6	DEC	01	ChemPort single article sales feature unavailable
NEWS	7	DEC	12	GBFULL now offers single source for full-text coverage of complete UK patent families
NEWS	8	DEC	17	Fifty-one pharmaceutical ingredients added to PS
NEWS	9	JAN	06	The retention policy for unread STNmail messages will change in 2009 for STN-Columbus and STN-Tokyo
NEWS	10	JAN	07	WPIDS, WPINDEX, and WPIX enhanced Japanese Patent Classification Data
NEWS	11	FEB	02	Simultaneous left and right truncation (SLART) added for CERAB, COMPUAB, ELCOM, and SOLIDSTATE
NEWS	12	FEB	02	GENBANK enhanced with SET PLURALS and SET SPELLING
NEWS	13	FEB	06	Patent sequence location (PSL) data added to USGENE
NEWS	14	FEB	10	COMPENDEX reloaded and enhanced
NEWS	15	FEB	11	WTEXTILES reloaded and enhanced
NEWS	16	FEB	19	New patent-examiner citations in 300,000 CA/CAPLUS patent records provide insights into related prior art
NEWS	17	FEB	19	Increase the precision of your patent queries -- use terms from the IPC Thesaurus, Version 2009.01
NEWS	18	FEB	23	Several formats for image display and print options discontinued in USPATFULL and USPAT2
NEWS	19	FEB	23	MEDLINE now offers more precise author group fields and 2009 MeSH terms
NEWS	20	FEB	23	TOXCENTER updates mirror those of MEDLINE - more precise author group fields and 2009 MeSH terms
NEWS	21	FEB	23	Three million new patent records blast AEROSPACE into STN patent clusters
NEWS	22	FEB	25	USGENE enhanced with patent family and legal status display data from INPADOCDB
NEWS	23	MAR	06	INPADOCDB and INPAFAMDB enhanced with new display formats
NEWS	24	MAR	11	EPFULL backfile enhanced with additional full-text applications and grants
NEWS	25	MAR	11	ESBIOBASE reloaded and enhanced
NEWS	26	MAR	20	CAS databases on STN enhanced with new super role for nanomaterial substances
NEWS	27	MAR	23	CA/CAPLUS enhanced with more than 250,000 patent equivalents from China
NEWS EXPRESS	JUNE	27	08	CURRENT WINDOWS VERSION IS V8.3, AND CURRENT DISCOVER FILE IS DATED 23 JUNE 2008.
NEWS HOURS	STN Operating Hours Plus Help Desk Availability			
NEWS LOGIN	Welcome Banner and News Items			
NEWS IPC8	For general information regarding STN implementation of IPC 8			

Enter NEWS followed by the item number or name to see news on that specific topic.

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\* \* \* \* \* STN Columbus \* \* \* \* \*

FILE 'HOME' ENTERED AT 16:36:21 ON 27 MAR 2009

=> file reg		
COST IN U.S. DOLLARS	SINCE FILE	TOTAL
	ENTRY	SESSION
FULL ESTIMATED COST	0.88	0.88

FILE 'REGISTRY' ENTERED AT 16:38:48 ON 27 MAR 2009  
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STRUCTURE FILE UPDATES: 26 MAR 2009 HIGHEST RN 1127762-87-1  
DICTIONARY FILE UPDATES: 26 MAR 2009 HIGHEST RN 1127762-87-1

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<http://www.cas.org/support/stngen/stndoc/properties.html>

=>  
Uploading C:\Program Files\Stnexp\Queries\10511564-butane-RCE.str

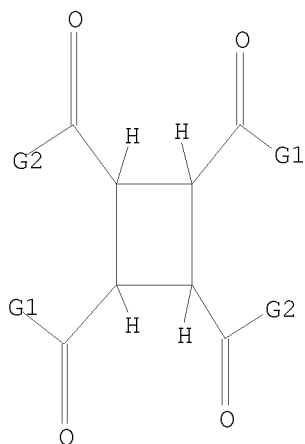
L1 STRUCTURE UPLOADED

=> d l1  
L1 HAS NO ANSWERS  
L1 STR

O-H

N 2

O-<sup>3</sup>Ak



G1 [@1],[@2],[@3]

G2 [@2],[@3]

Structure attributes must be viewed using STN Express query preparation.

=> s l1

SAMPLE SEARCH INITIATED 16:39:17 FILE 'REGISTRY'

SAMPLE SCREEN SEARCH COMPLETED - 2341 TO ITERATE

85.4% PROCESSED 2000 ITERATIONS

11 ANSWERS

INCOMPLETE SEARCH (SYSTEM LIMIT EXCEEDED)

SEARCH TIME: 00.00.01

FULL FILE PROJECTIONS: ONLINE \*\*COMPLETE\*\*  
BATCH \*\*COMPLETE\*\*

PROJECTED ITERATIONS: 43918 TO 49722

PROJECTED ANSWERS: 42 TO 472

L2 11 SEA SSS SAM L1

=> s l1 full

FULL SEARCH INITIATED 16:39:21 FILE 'REGISTRY'

FULL SCREEN SEARCH COMPLETED - 47253 TO ITERATE

100.0% PROCESSED 47253 ITERATIONS

198 ANSWERS

SEARCH TIME: 00.00.02

L3 198 SEA SSS FUL L1

=> file caplus

COST IN U.S. DOLLARS

SINCE FILE  
ENTRY

TOTAL  
SESSION

FULL ESTIMATED COST

185.88

186.76

FILE 'CAPLUS' ENTERED AT 16:39:28 ON 27 MAR 2009  
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FILE COVERS 1907 - 27 Mar 2009 VOL 150 ISS 14  
FILE LAST UPDATED: 26 Mar 2009 (20090326/ED)

Caplus now includes complete International Patent Classification (IPC) reclassification data for the third quarter of 2008.

CAS Information Use Policies apply and are available at:

<http://www.cas.org/legal/infopolicy.html>

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> s l3

L4 78 L3

=> s l4 not py > 2003

7039611 PY > 2003

L5 67 L4 NOT PY > 2003

=> d l5 ibib abs hitstr 1-

YOU HAVE REQUESTED DATA FROM 67 ANSWERS - CONTINUE? Y/(N):y

L5 ANSWER 1 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2001:489385 CAPLUS

DOCUMENT NUMBER: 135:77662

TITLE: Preparation of alicyclic epoxy ester for cured resin  
INVENTOR(S): Shimoda, Teruyoshi; Date, Hideki; Takahashi, Yasushi;  
Hatanaka, Kohei

PATENT ASSIGNEE(S): Asahi Kasei K. K., Japan; Asahi Kasei Epoxy Co., Ltd.

SOURCE: PCT Int. Appl., 226 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2001047907	A1	20010705	WO 2000-JP9352	20001227
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY,			

DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF,  
 BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG  
 JP 2001181238 A 20010703 JP 1999-368841 19991227  
 JP 2003286276 A 20031010 JP 1999-369308 19991227  
 PRIORITY APPLN. INFO.: JP 1999-368841 A 19991227  
 JP 1999-369308 A 19991227

OTHER SOURCE(S): MARPAT 135:77662

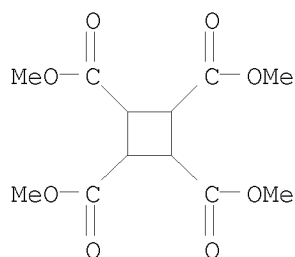
AB Compound RXxYyZz is prepared for cured resin, wherein X is 2,3-epoxycyclohexyl ester or 2,3-epoxycyclopentyl ester, Y is epoxyalkyl ester and Z is alkyl ester, x +1-20. yr=0-5, z=0-5, and x + y =2-20. Thus, 1,3,5-benzenetricarboxylic acid 2,3-epoxycyclohexyl ester prepared by transesterification of corresponding acid Me ester and 3-hydroxycyclohexene followed by oxidation was mixed with curing agent at ratio 19.5/80.5 to give a product, showing good weather and water resistance.

IT 14495-41-1

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (preparation of alicyclic epoxy ester for cured resin)

RN 14495-41-1 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 2 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2000:395913 CAPLUS

DOCUMENT NUMBER: 133:317334

TITLE: Inhibition of farnesyltransferase with A-176120, a novel and potent farnesyl pyrophosphate analogue

AUTHOR(S): Tahir, S. K.; Gu, W.-Z.; Zhang, H.-C.; Leal, J.; Lee, J. Y.; Kovar, P.; Saeed, B.; Cherian, S. P.; Devine, E.; Cohen, J.; Warner, R.; Wang, Y.-C.; Stout, D.; Arendsen, D. L.; Rosenberg, S.; Ng, S.-C.

CORPORATE SOURCE: Pharmaceutical Product Research Division, Cancer Research, Abbott Laboratories, Abbott Park, IL, 60064, USA

SOURCE: European Journal of Cancer (2000), 36(9), 1161-1170  
 CODEN: EJCAEL; ISSN: 0959-8049

PUBLISHER: Elsevier Science Ltd.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Farnesylation of Ras is required for its transforming activity in human cancer and the reaction is catalyzed by the enzyme farnesyltransferase. Recently, we discovered a novel chemical series of potent farnesyl pyrophosphate (FPP) analogs which selectively inhibited farnesyltransferase. Our most potent compound to date in this series, A-176120, selectively inhibited farnesyltransferase activity (IC50 1.2±0.3 nM) over the closely related enzymes geranylgeranyltransferase I (GGTaseI) (IC50 423±1.8 nM), geranylgeranyltransferase II (GGTaseII) (IC50 3000 nM) and squalene synthase (SSase) (IC50°10000 nM).

A-176120 inhibited ras processing in H-ras-transformed NIH3T3 cells and HCT116 K-ras-mutated cells (ED50 1.6 and 0.5  $\mu$ M, resp.). The anti-angiogenic potential of A-176120 was demonstrated by a decrease in Ras processing, cell proliferation and capillary structure formation of human umbilical vein endothelial cells (HUVEC), and a decrease in the secretion of vascular endothelial growth factor (VEGF) from HCT116 cells. In vivo, A-176120 reduced H-ras NIH3T3 tumor growth and extended the lifespan of nude mice inoculated with H- or K-ras-transformed NIH3T3 cells. A-176120 also had an additive effect in combination with cyclophosphamide in nude mice inoculated with K-ras NIH3T3 transformed cells. Overall, our results demonstrate that A-176120 is a potent FPP mimetic with both antitumor and anti-angiogenic properties.

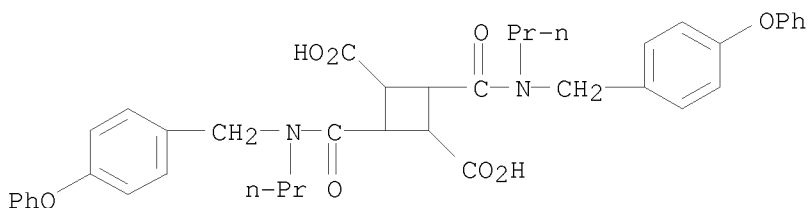
IT 303068-56-6, A 87050 303068-57-7, A 88681

RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)

(farnesyltransferase inhibition by A-176120, novel and potent farnesyl pyrophosphate analog)

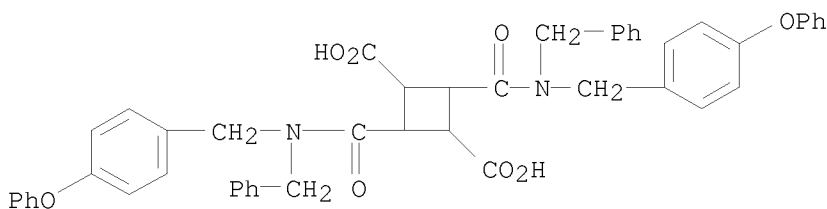
RN 303068-56-6 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]- (CA INDEX NAME)



RN 303068-57-7 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(4-phenoxyphenyl)methyl](phenylmethyl)amino]carbonyl]- (CA INDEX NAME)



REFERENCE COUNT: 36 THERE ARE 36 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 3 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1998:723573 CAPLUS

DOCUMENT NUMBER: 129:343334

ORIGINAL REFERENCE NO.: 129:69929a,69932a

TITLE: Preparation of cyclobutane-derivative inhibitors of squalene synthase and protein farnesyl transferase

INVENTOR(S): Arendsen, David L.; Baker, William R.; Fakhoury, Stephen A.; Fung, Anthony K. L.; Garvey, David S.; McClellan, William J.; O'connor, Stephen J.; Prasad, Rajnandan N.; Rockway, Todd W.; Rosenberg, Saul H.; Stein, Herman H.; Shen, Wang; Stout, David M.; Sullivan, Gerard M.; Augeri, David J.

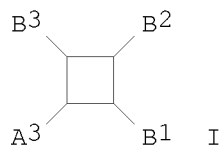
PATENT ASSIGNEE(S): Abbott Laboratories, USA

SOURCE: U.S., 45 pp., Cont.-in-part of U.S. Ser. No. 564,524,

DOCUMENT TYPE: abandoned.  
 LANGUAGE: CODEN: USXXAM  
 FAMILY ACC. NUM. COUNT: Patent  
 PATENT INFORMATION: English  
 2

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5831115	A	19981103	US 1996-626859	19960412
CA 2218597	A1	19961024	CA 1996-2218597	19960418
WO 9633159	A1	19961024	WO 1996-US5529	19960418
W: CA, JP, MX				
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
EP 821665	A1	19980204	EP 1996-912978	19960418
EP 821665	B1	20011004		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, PT, IE, FI				
JP 11504017	T	19990406	JP 1996-531980	19960418
EP 1090908	A2	20010411	EP 2000-124275	19960418
EP 1090908	A3	20010516		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, PT, IE, FI				
AT 206390	T	20011015	AT 1996-912978	19960418
PRIORITY APPLN. INFO.:				
			US 1995-426553	B2 19950421
			US 1995-428357	B2 19950421
			US 1995-564524	B2 19951129
			US 1996-626859	A 19960412
			EP 1996-912978	A3 19960418
			WO 1996-US5529	W 19960418

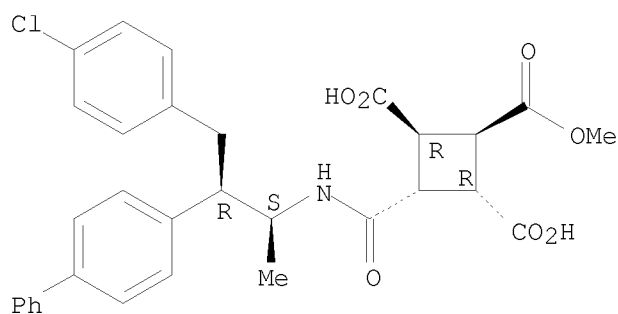
OTHER SOURCE(S): MARPAT 129:343334  
 GI



AB The title compds (I; permitted substituent values are defined in the disclosure), useful for inhibiting protein farnesyl transferase and the farnesylation of the oncogene protein Ras, or for inhibiting de-novo squalene production resulting in the inhibition of cholesterol biosynthesis, are prepared Thus, (1 $\alpha$ , 2 $\beta$ , 3 $\beta$ , 4 $\alpha$ )-1-[N-benzyl-N-[(4S, 5S)-(4-hydroxy-5-methyl)-6-phenylhexyl]aminocarbonyl]cyclobutane-2, 3, 4-tricarboxylic acid, prepared from propionaldehyde in 10 steps, demonstrated a 92% inhibition of protein farnesyl transferase at 1 $\mu$ M.

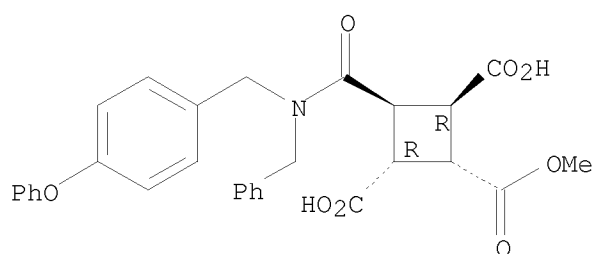
IT 1101453-50-2  
 RL: PRPH (Prophetic)  
 (Preparation of cyclobutane-derivative inhibitors of squalene synthase and protein farnesyl transferase)  
 RN 1101453-50-2 CAPLUS  
 CN 1, 2, 3-Cyclobutanetricarboxylic acid,  
 4-[[[(1S, 2R)-2-[1, 1'-biphenyl]-4-yl-3-(4-chlorophenyl)-1-methylpropyl]amino]carbonyl]-, 2-methyl ester, (1R, 2 $\beta$ , 3R, 4 $\alpha$ )-  
 (CA INDEX NAME)

Absolute stereochemistry.



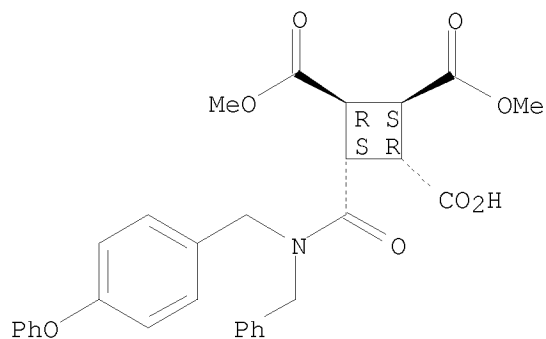
IT 184228-21-5P 184228-25-9P 184228-39-5P  
 184488-03-7P  
 RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)  
 (preparation of cyclobutane-derivative inhibitors of squalene synthase and protein farnesyl transferase)  
 RN 184228-21-5 CAPLUS  
 CN 1,2,3-Cyclobutanetricarboxylic acid,  
 4-[[[(4-phenoxyphenyl)methyl](phenylmethyl)amino]carbonyl]-, 2-methyl ester, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.



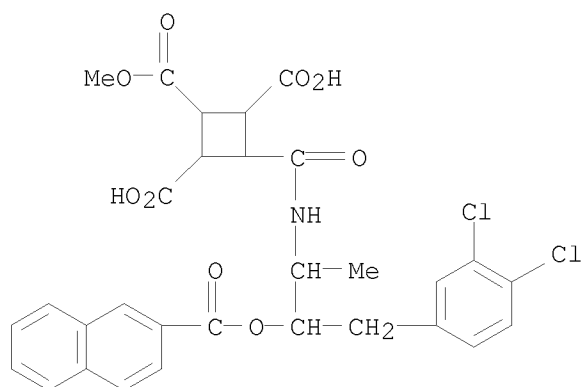
RN 184228-25-9 CAPLUS  
 CN 1,2,3-Cyclobutanetricarboxylic acid,  
 4-[[[(4-phenoxyphenyl)methyl](phenylmethyl)amino]carbonyl]-, 1,2-dimethyl ester, (1R, 2S, 3R, 4S)-rel- (CA INDEX NAME)

Relative stereochemistry.



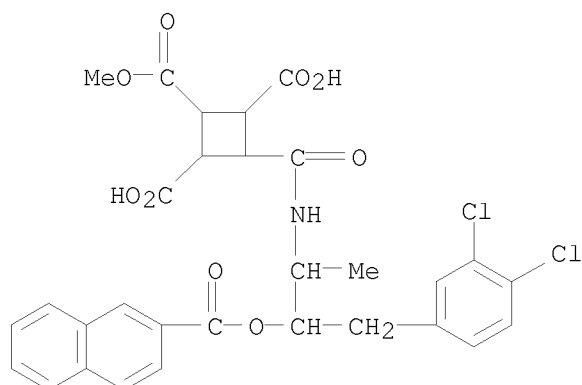
RN 184228-39-5 CAPLUS  
 CN 1,2,3-Cyclobutanetricarboxylic acid,  
 4-[[[(1S, 2R)-3-(3,4-dichlorophenyl)-1-methyl-2-[(2-naphthalenylcarbonyl)oxy]propyl]amino]carbonyl]-, 2-methyl ester,

stereoisomer (9CI) (CA INDEX NAME)



RN 184488-03-7 CAPLUS

CN 1,2,3-Cyclobutanetricarboxylic acid,  
4-[[[(1S,2R)-3-(3,4-dichlorophenyl)-1-methyl-2-[(2-naphthalenylcarbonyl)oxy]propyl]amino]carbonyl]-, 2-methyl ester,  
stereoisomer (9CI) (CA INDEX NAME)



REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 4 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1998:502539 CAPLUS

DOCUMENT NUMBER: 129:135923

ORIGINAL REFERENCE NO.: 129:27793a,27796a

TITLE: Cyclobutane derivatives as inhibitors of squalene synthetase and protein farnesyltransferase

INVENTOR(S): Baker, William R.; Rosenberg, Saul H.; Fung, Anthony K. L.; Rockway, Todd W.; Fakhoury, Stephen A.; Garvey, David S.; Donner, B. Gregory; O'Connor, Stephen J.; Prasad, Rajnandan N.; Shen, Wang; Stout, David M.; Sullivan, Gerard M.

PATENT ASSIGNEE(S): Abbott Laboratories, USA

SOURCE: U.S., 103 pp., Cont.-in-part of U.S. Ser. No. 429,095, abandoned.

CODEN: USXXAM

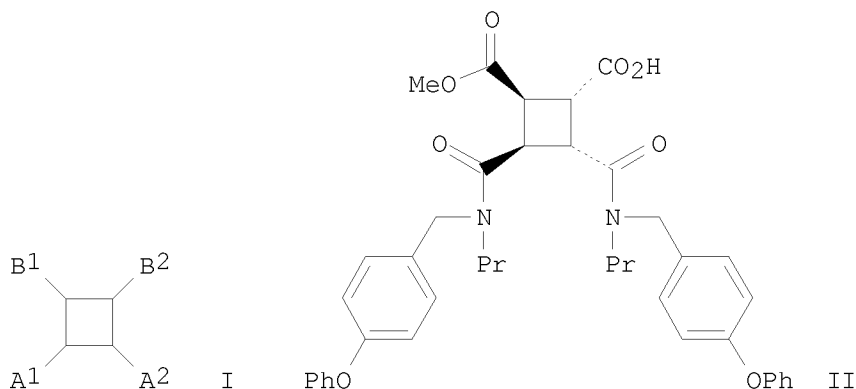
DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 3

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5783593	A	19980721	US 1996-633262	19960429
WO 9634851	A1	19961107	WO 1996-US6193	19960502
W: AU, CA, JP, KR, MX				
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
AU 9656731	A	19961121	AU 1996-56731	19960502
PRIORITY APPLN. INFO.:			US 1993-147708	B2 19931104
			US 1994-289711	B2 19940909
			US 1994-322783	B2 19941018
			US 1995-429095	B2 19950503
			US 1996-633262	A 19960429
			WO 1996-US6193	W 19960502
OTHER SOURCE(S):		MARPAT 129:135923		
GI				

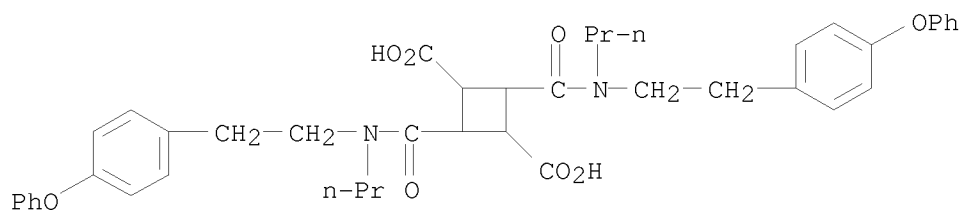


- AB The invention provides compds. I [A1, A2 = -XC(O)G, -XC(S)G, -(CH2)<sub>q</sub>NR1R2; X = bond, CH2, O, S, (un)substituted NH; G = R2, NR1R2, OR2, SR2; R1 = H, alkyl, alkenyl, (un)substituted aryl, heterocyclyl, etc.; R2 = alkenyl, (un)substituted aryl, heterocyclyl, etc.; q = 0-2; B1, B2 = CH2OH, CH:NOH, WR3, etc.; W = bond, alkylene, alkenylene, CONH, NHCONH; R3 = various (un)substituted heterocyclic groups or squaric acid residue]. Also disclosed are preparation processes, intermediates, pharmaceutical compns., and treatment of hypercholesterolemic disorders (hyperlipidemia, atherosclerosis), cancer, or fungal infections using the compds. I inhibit biosynthesis of cholesterol (and also fungal growth) by inhibiting squalene synthetase. I also inhibit farnesylation of the oncogene protein Ras by inhibiting protein farnesyltransferase (no data). For example, aminolysis of 1,2,3,4-cyclobutanetetracarboxylic dianhydride with 2 equiv 4-(PhO)C6H4CH2NHPr, followed by monoesterification of the resultant diacid with (R)-(-)-sec-phenethyl alc., separation of one diastereomer, hydrogenolytic deesterification to a single diacid enantiomer, diesterification of this with diazomethane, and partial hydrolysis with LiOH, gave claimed title compound (-)-II. A large group of tested compds. I gave 50-99% inhibition of rat liver microsomal squalene synthetase at 10 μM in vitro. Approx. 380 synthetic examples (over 185 compds. with data) are given.
- IT 169943-31-1P 169943-32-2P 169943-33-3P  
169943-34-4P 169943-35-5P 169943-36-6P  
169943-37-7P 169943-38-8P 169943-39-9P  
RL: BYP (Byproduct); PREP (Preparation)  
(byproduct; preparation of cyclobutane derivs. as inhibitors of squalene

synthetase and protein farnesyltransferase)

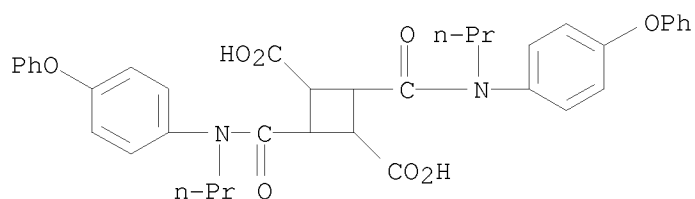
RN 169943-31-1 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[2-(4-phenoxyphenyl)ethyl]propylamino]carbonyl]- (CA INDEX NAME)



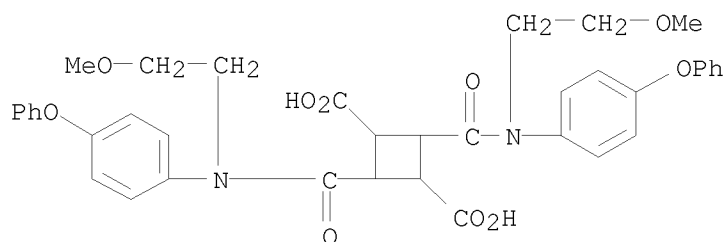
RN 169943-32-2 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-phenoxyphenyl]propylamino]carbonyl]- (CA INDEX NAME)



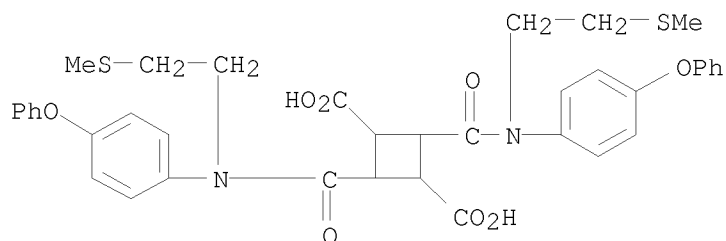
RN 169943-33-3 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[2-methoxyethyl](4-phenoxyphenyl)amino]carbonyl]- (CA INDEX NAME)



RN 169943-34-4 CAPLUS

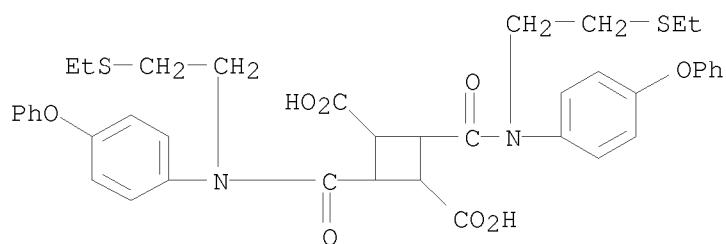
CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[2-(methylthio)ethyl](4-phenoxyphenyl)amino]carbonyl]- (CA INDEX NAME)



RN 169943-35-5 CAPLUS

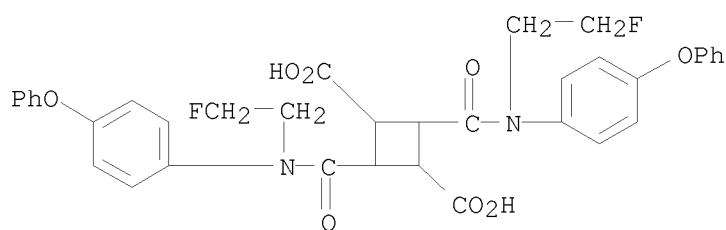
CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[2-(ethylthio)ethyl](4-phenoxyphenyl)amino]carbonyl]- (CA INDEX NAME)

phenoxyphenyl)amino]carbonyl]- (CA INDEX NAME)



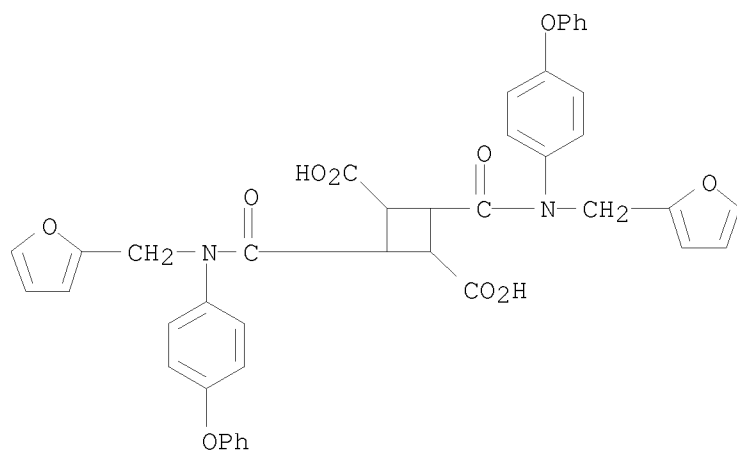
RN 169943-36-6 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-fluoroethyl)(4-phenoxyphenyl)amino]carbonyl]- (CA INDEX NAME)



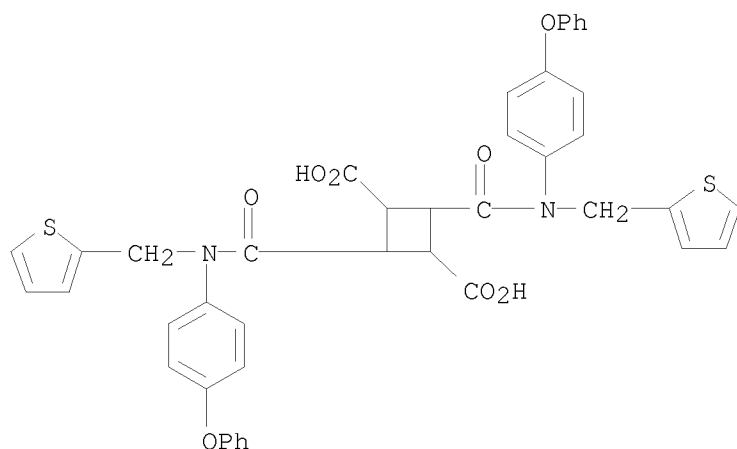
RN 169943-37-7 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-furanylmethyl)(4-phenoxyphenyl)amino]carbonyl]- (CA INDEX NAME)

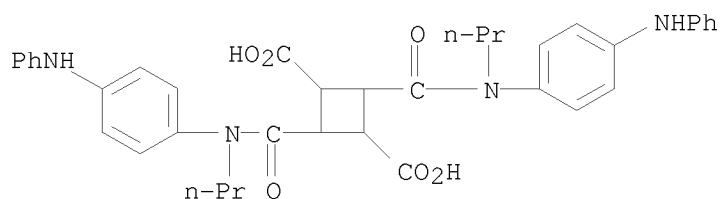


RN 169943-38-8 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-phenoxyphenyl)(2-thienylmethyl)amino]carbonyl]- (CA INDEX NAME)

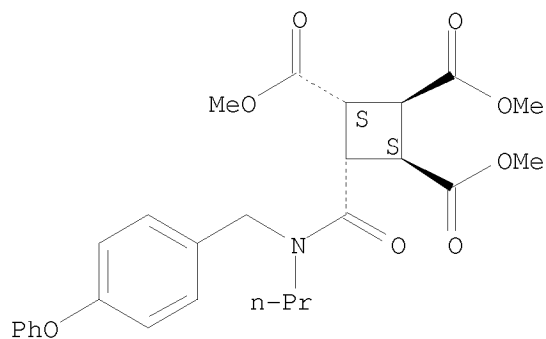


RN 169943-39-9 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(phenylamino)phenyl]methyl]propylamino]carbonyl]- (CA INDEX NAME)



IT 169942-85-2P 169943-03-7P 169943-05-9P  
 169943-06-0P 169943-07-1P 170207-72-4P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (intermediate; preparation of cyclobutane derivs. as inhibitors of squalene synthetase and protein farnesyltransferase)  
 RN 169942-85-2 CAPLUS  
 CN 1,2,3-Cyclobutanetricarboxylic acid, 4-[[[4-(phenoxymethyl)phenyl]methyl]propylamino]carbonyl]-, trimethyl ester, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

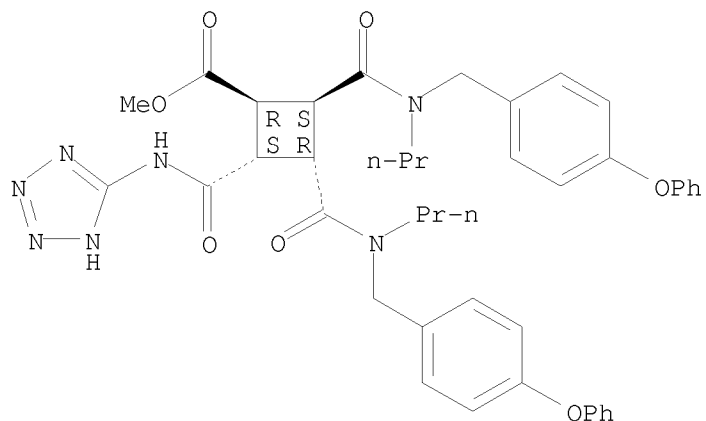
Relative stereochemistry.



RN 169943-03-7 CAPLUS  
 CN Cyclobutanedicarboxylic acid, 2,3-bis[[[4-(phenoxymethyl)phenyl]methyl]propylamino]carbonyl]-4-[(1H-tetrazol-5-ylamino)carbonyl]-, methyl ester, (1R,2S,3R,4S)-rel- (9CI) (CA INDEX NAME)

NAME)

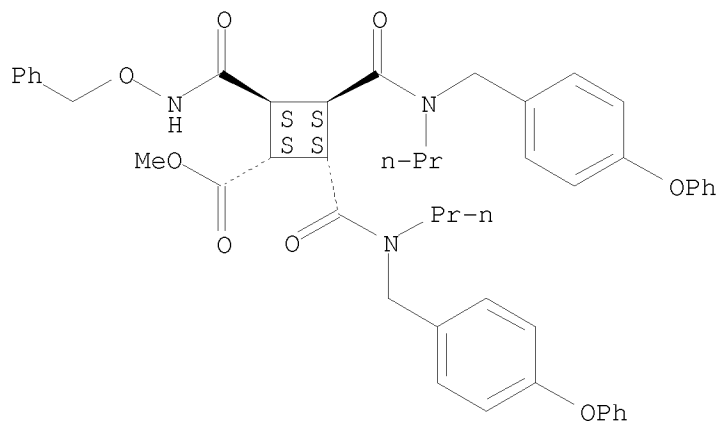
Relative stereochemistry.



RN 169943-05-9 CAPLUS

CN Cyclobutanecarboxylic acid, 2,3-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-4-[[ (phenylmethoxy)amino]carbonyl]-, methyl ester, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

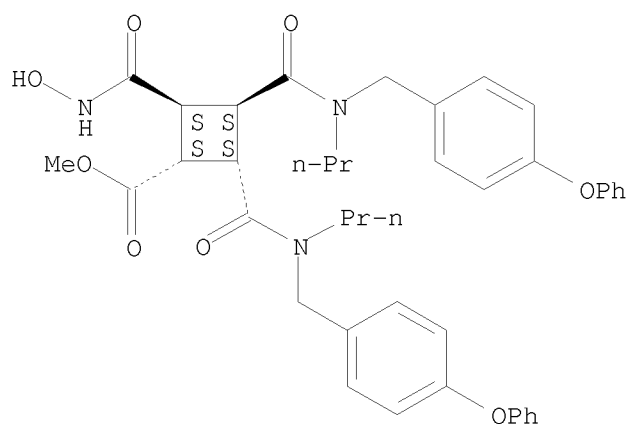
Relative stereochemistry.



RN 169943-06-0 CAPLUS

CN Cyclobutanecarboxylic acid, 2-[(hydroxyamino)carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, methyl ester, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

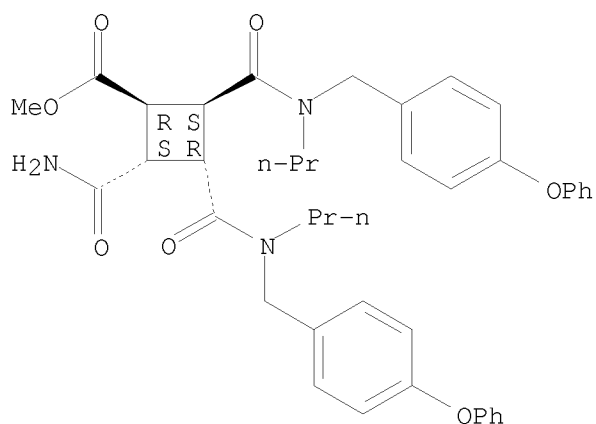
Relative stereochemistry.



RN 169943-07-1 CAPLUS

CN Cyclobutanecarboxylic acid, 2-(aminocarbonyl)-3,4-bis[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, methyl ester, (1R,2S,3R,4S)-rel- (CA INDEX NAME)

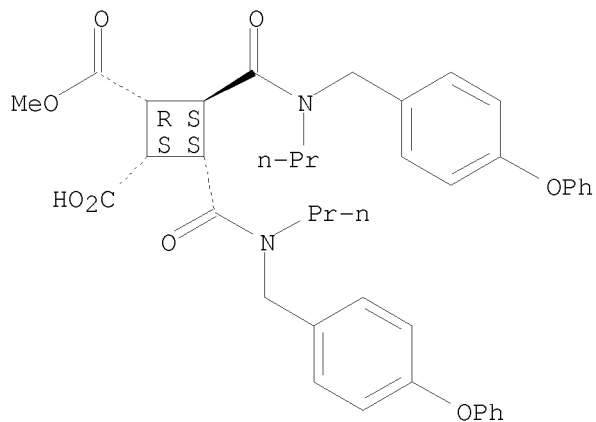
Relative stereochemistry.



RN 170207-72-4 CAPLUS

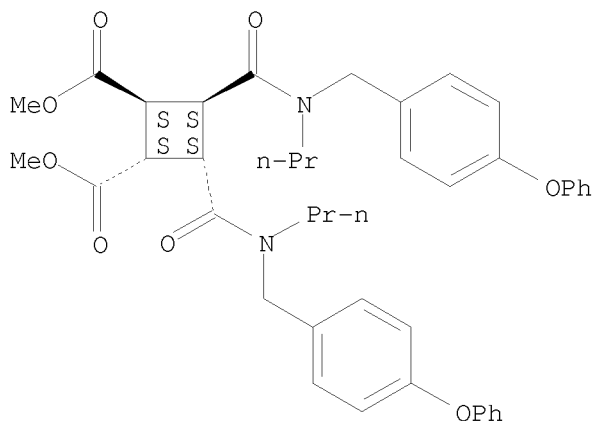
CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, monomethyl ester, (1R,2S,3S,4S)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



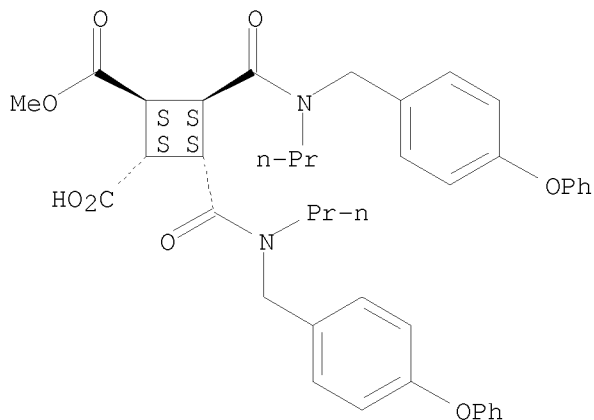
IT 169942-55-6P 169942-56-7P  
 RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); RCT (Reactant); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)  
 (preparation of cyclobutane derivs. as inhibitors of squalene synthetase and protein farnesyltransferase)  
 RN 169942-55-6 CAPLUS  
 CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, dimethyl ester, (1R,2R,3R,4R)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



RN 169942-56-7 CAPLUS  
 CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, monomethyl ester, (1R,2R,3R,4R)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



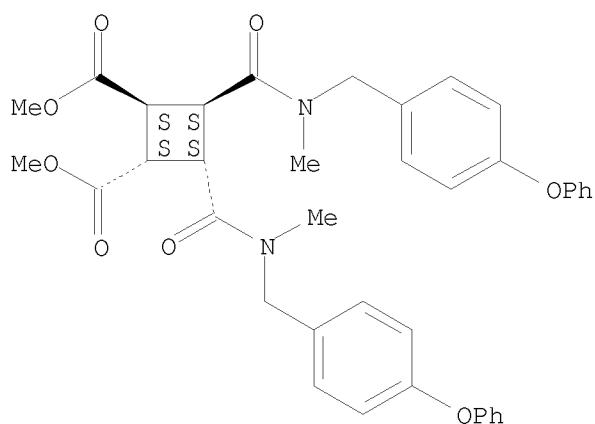
IT 169942-41-0P 169942-53-4P 169942-57-8P  
 169942-58-9P 169942-63-6P 169942-65-8P  
 169942-67-0P 169942-68-1P 169942-69-2P  
 169942-70-5P 169944-08-5P 169944-09-6P  
 185209-36-3P 185209-37-4P 185209-38-5P  
 185209-39-6P 185209-40-9P 185209-41-0P  
 185209-42-1P 185209-43-2P 185209-44-3P  
 185209-64-7P 185209-78-3P

RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)  
(preparation of cyclobutane derivs. as inhibitors of squalene synthetase and protein farnesyltransferase)

RN 169942-41-0 CAPLUS

CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[methyl[(4-phenoxyphenyl)methyl]amino]carbonyl]-, dimethyl ester, (1R,2R,3R,4R)-rel- (9CI) (CA INDEX NAME)

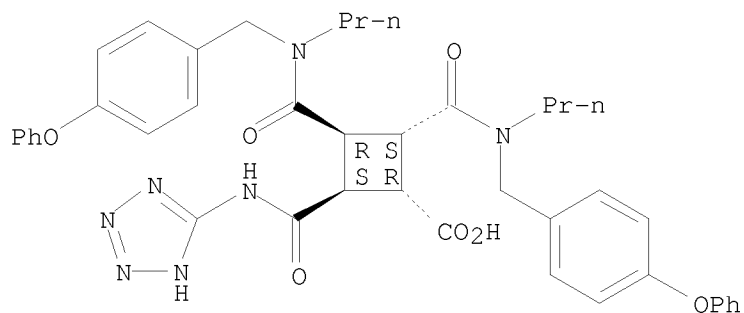
Relative stereochemistry.



RN 169942-53-4 CAPLUS

CN Cyclobutanecarboxylic acid, 2,3-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-4-[(1H-tetrazol-5-ylamino)carbonyl]-, (1R,2S,3R,4S)-rel- (9CI) (CA INDEX NAME)

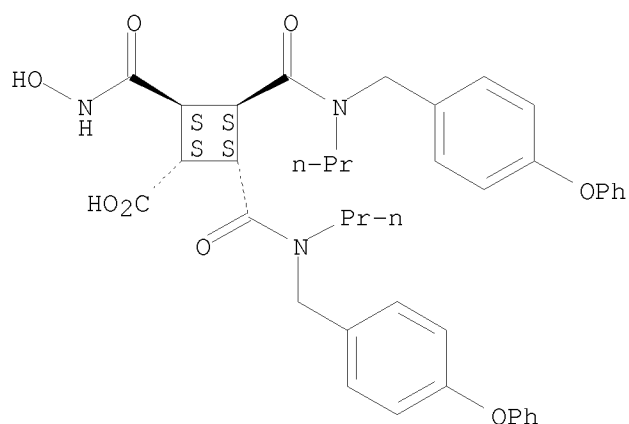
Relative stereochemistry.



RN 169942-57-8 CAPLUS

CN Cyclobutanecarboxylic acid, 2-[(hydroxyamino)carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

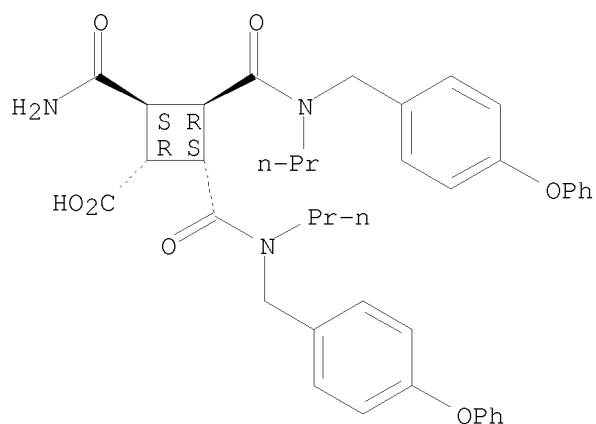
Relative stereochemistry.



RN 169942-58-9 CAPLUS

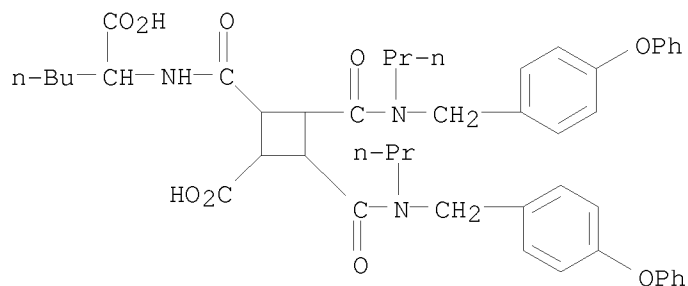
CN Cyclobutanecarboxylic acid, 2-(aminocarbonyl)-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1R,2S,3R,4S)-rel- (CA INDEX NAME)

Relative stereochemistry.



RN 169942-63-6 CAPLUS

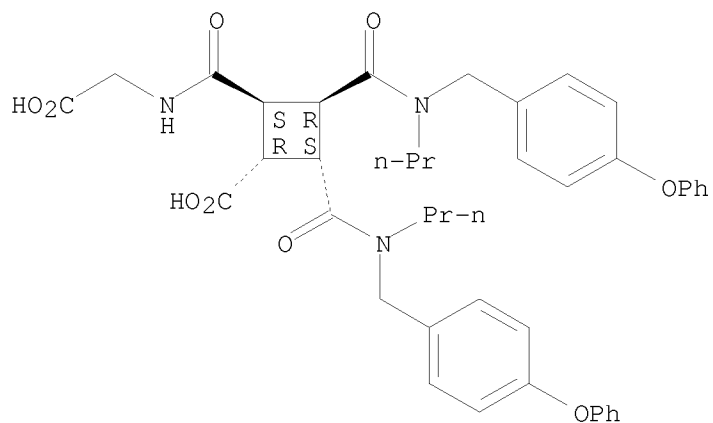
CN Cyclobutanecarboxylic acid, 2-[[[(1-carboxypentyl)amino]carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]- (CA INDEX NAME)



RN 169942-65-8 CAPLUS

CN Cyclobutanecarboxylic acid, 2-[[[(carboxymethyl)amino]carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1R,2S,3R,4S)-rel- (CA INDEX NAME)

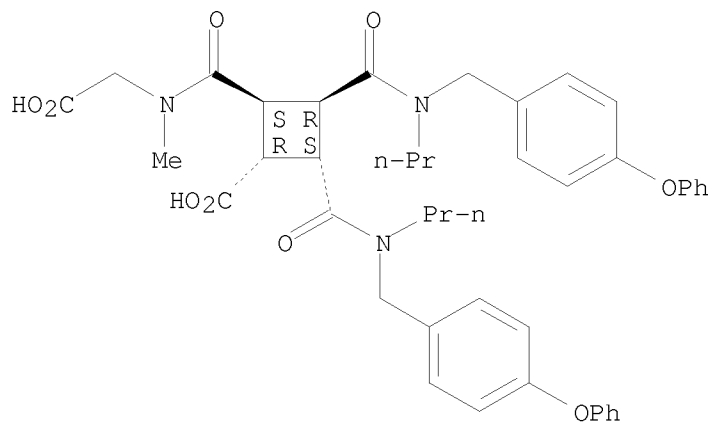
Relative stereochemistry.



RN 169942-67-0 CAPLUS

CN Cyclobutanecarboxylic acid, 2-[[[(carboxymethyl)methylamino]carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1R,2S,3R,4S)-rel- (CA INDEX NAME)

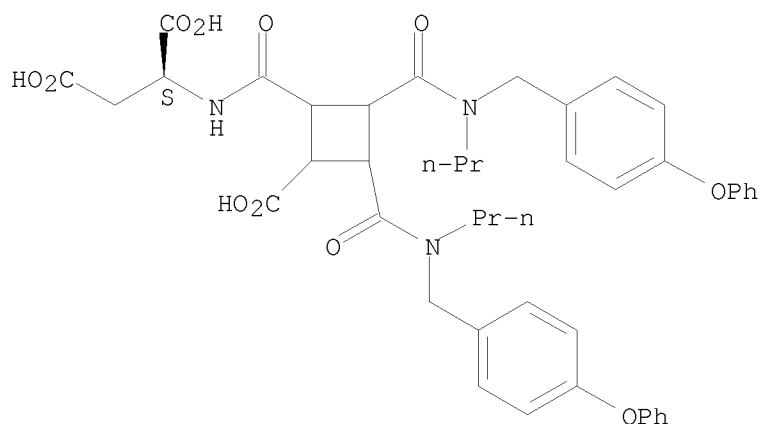
Relative stereochemistry.



RN 169942-68-1 CAPLUS

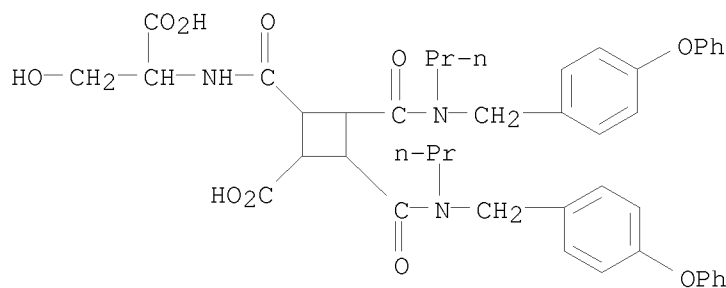
CN L-Aspartic acid, N-[[[2-carboxy-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]cyclobutyl]carbonyl]- (CA INDEX NAME)

Absolute stereochemistry.



RN 169942-69-2 CAPLUS

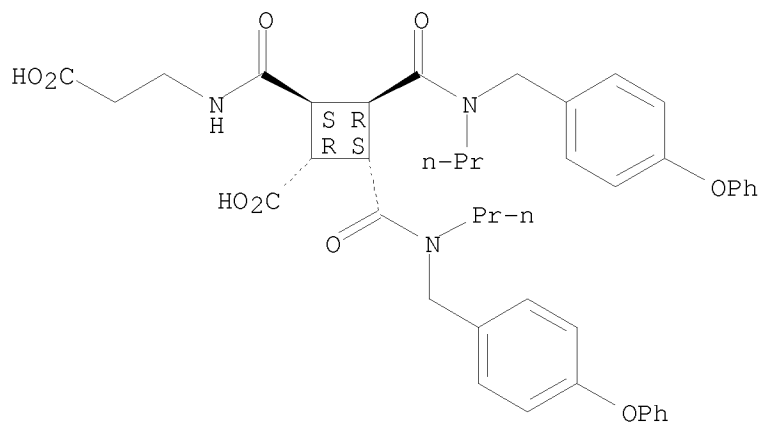
CN Cyclobutanecarboxylic acid, 2-[[[(1-carboxy-2-hydroxyethyl)amino]carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]- (CA INDEX NAME)



RN 169942-70-5 CAPLUS

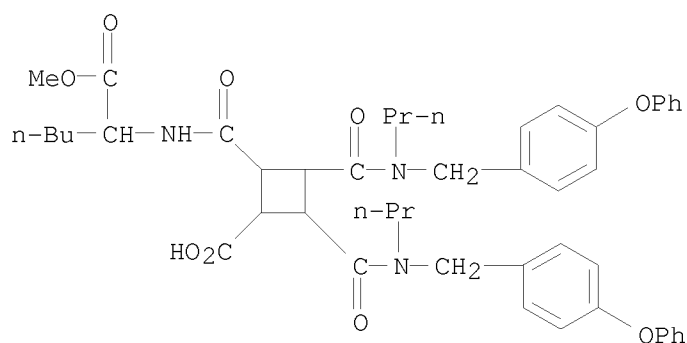
CN Cyclobutanecarboxylic acid, 2-[[[(2-carboxyethyl)amino]carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1R,2S,3R,4S)-rel- (CA INDEX NAME)

Relative stereochemistry.

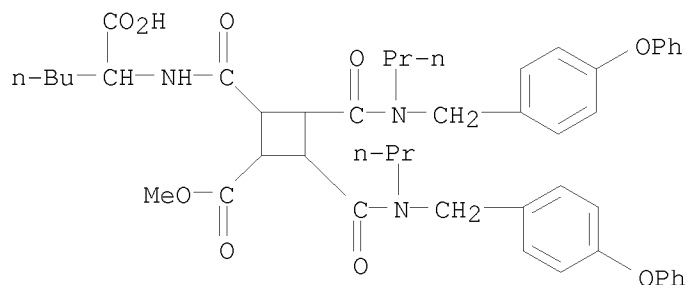


RN 169944-08-5 CAPLUS

CN Cyclobutanecarboxylic acid, 2-[[[1-(methoxycarbonyl)pentyl]amino]carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]- (CA INDEX NAME)

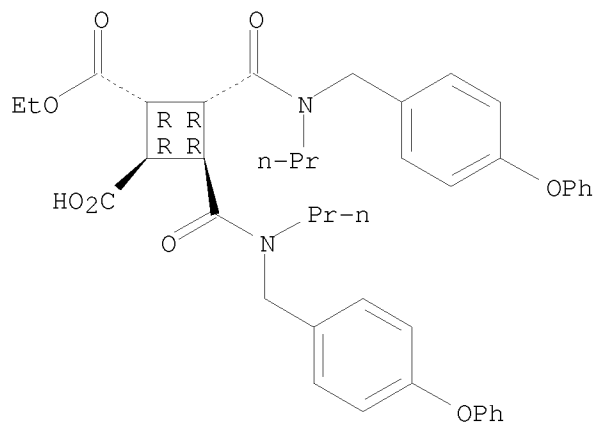


RN 169944-09-6 CAPLUS  
 CN Cyclobutanecarboxylic acid, 2-[[[(1-carboxypentyl)amino]carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, 1-methyl ester (CA INDEX NAME)



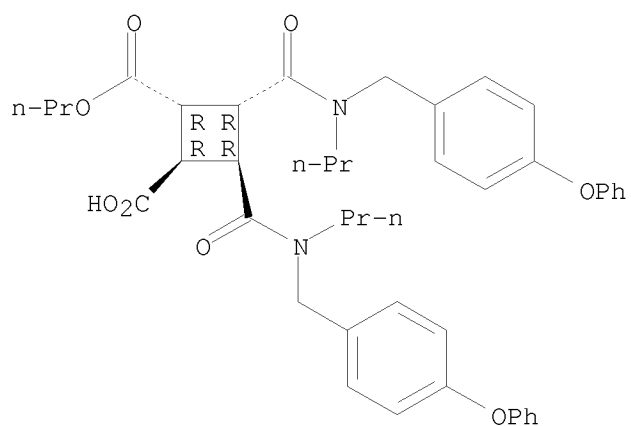
RN 185209-36-3 CAPLUS  
 CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, 1-ethyl ester, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

Relative stereochemistry.



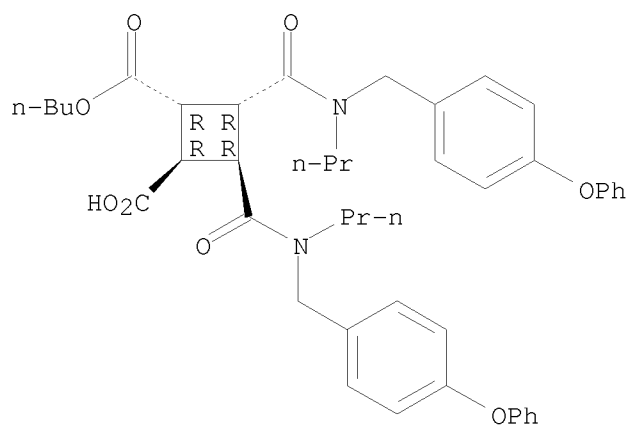
RN 185209-37-4 CAPLUS  
 CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, 1-propyl ester, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

Relative stereochemistry.



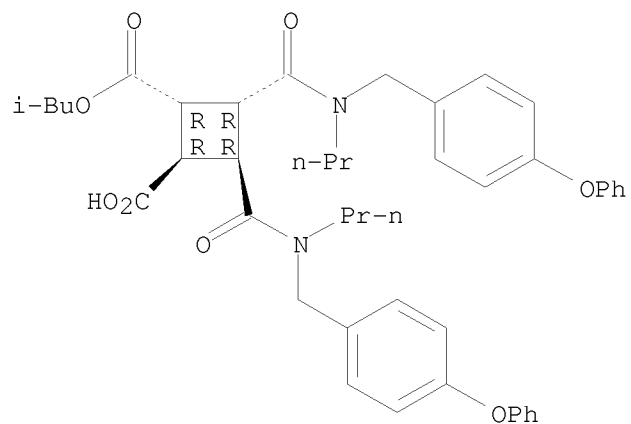
RN 185209-38-5 CAPLUS  
 CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, 1-butyl ester, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

Relative stereochemistry.



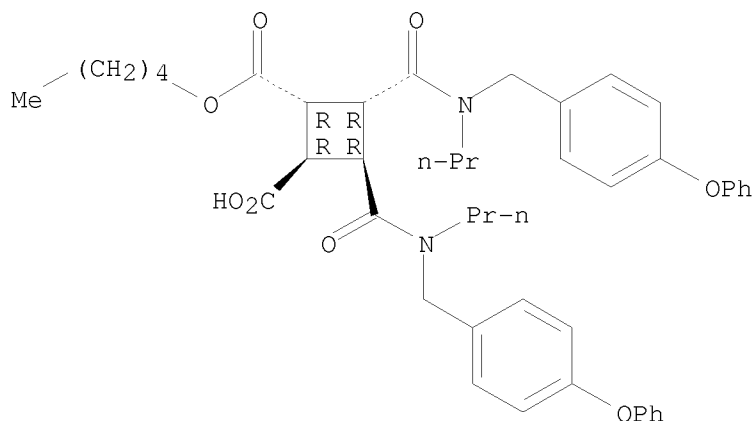
RN 185209-39-6 CAPLUS  
 CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, mono(2-methylpropyl) ester, (1R,2R,3R,4R)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



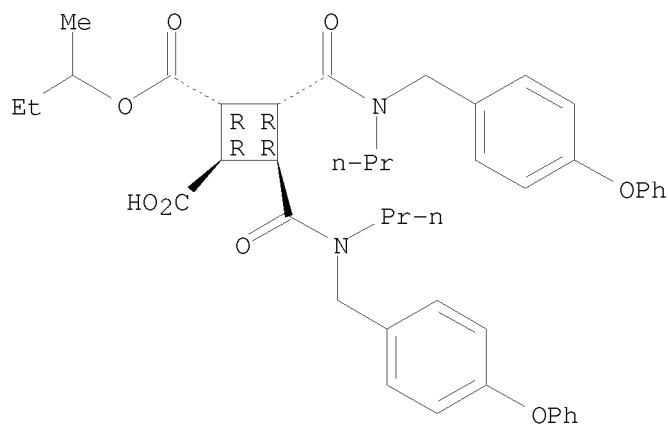
RN 185209-40-9 CAPLUS  
 CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, 1-pentyl ester, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

Relative stereochemistry.



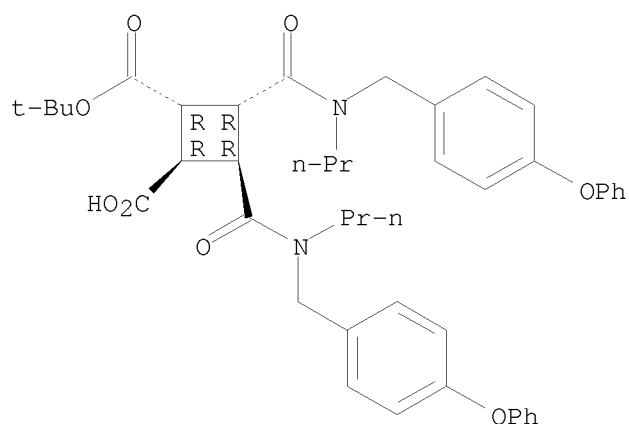
RN 185209-41-0 CAPLUS  
 CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, 1-(1-methylpropyl) ester, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

Relative stereochemistry.



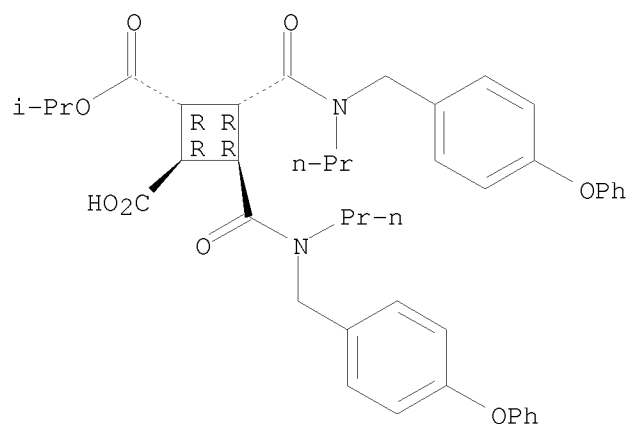
RN 185209-42-1 CAPLUS  
 CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, 1-(1,1-dimethylethyl) ester, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

Relative stereochemistry.



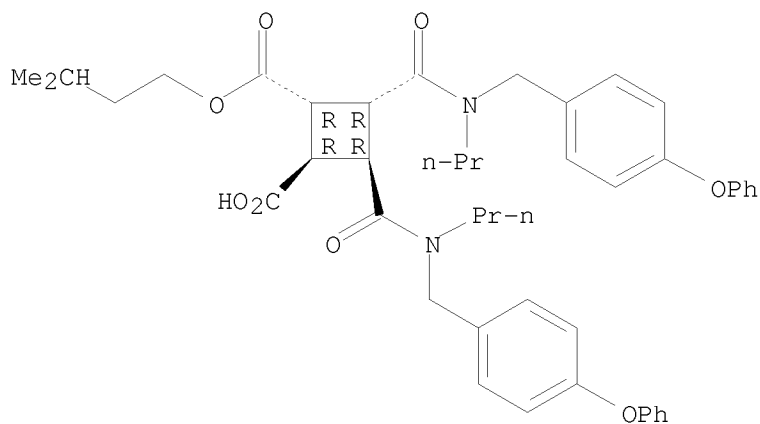
RN 185209-43-2 CAPLUS  
 CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, 1-(1-methylethyl) ester, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

Relative stereochemistry.



RN 185209-44-3 CAPLUS  
 CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, mono(3-methylbutyl) ester, (1R,2R,3R,4R)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



CN Cyclobutanecarboxylic acid, 2-[[[(methylsulfonyl)amino]carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, 1-methyl ester, (1R,2R,3R,4R)-rel-(-)- (CA INDEX NAME)

L5 ANSWER 5 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN  
ACCESSION NUMBER: 1998:235919 CAPLUS  
DOCUMENT NUMBER: 128:270941  
ORIGINAL REFERENCE NO.: 128:53641a,53644a  
TITLE: Preparation and properties of high molecular weight  
polyamic ester having a cyclobutane moiety in the main  
chain  
AUTHOR(S): Hasegawa, Masaki; Miura, Hirohiko; Haga, Naoki;  
Hayakawa, Akira; Saito, Kiyoshi  
CORPORATE SOURCE: Department of Materials Science and Technology,  
Faculty of Engineering, Toin University of Yokohama,  
Yokohama, 225, Japan

SOURCE: High Performance Polymers (1998), 10(1), 11-21  
 CODEN: HPPOEX; ISSN: 0954-0083  
 PUBLISHER: Institute of Physics Publishing  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB Preparation and properties of the polyimide derived from cyclobutanetetracarboxylic dianhydride (CBDA) with diamines are investigated, focusing on the interfacial polycondensation of cyclobutanetetracarboxylic acid di-Me ester dichloride (2a) with diamines. Di-Me ester was conveniently prepared from CBDA by refluxing in methanol solution. Di-Me ester consists of two regio isomers; one is  $\alpha$ -type (1a) with centrosymmetry, the other is  $\beta$ -type (1b) with plane symmetry. Separation of the mixture into each of pure 1a and 1b was successfully performed

by fractional crystallization. The structure of the first fraction is 1a, which was determined by x-ray crystal anal. The second fraction was necessarily assigned to 1b. 1A was converted into 2a by the reaction with thionyl chloride. The interfacial polycondensation of 2a with diamines afforded a high mol. weight polyamic ester. Polyimide was obtained only by heating the polyamic ester to about 230-280°C. The cyclobutane polyimide thus obtained was thermally stable up to 400°C, and less stable under hydrolysis than polypyromellitimide.

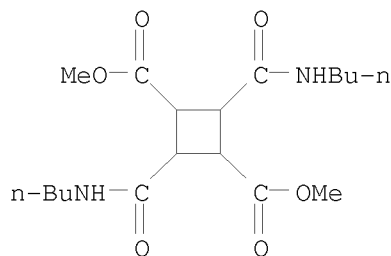
IT 205655-16-9P, 1,2,3,4-Cyclobutanetetracarboxylic acid 1,3-dimethyl ester-2,4-dibutylamide

RL: SPN (Synthetic preparation); PREP (Preparation)

(model compound; preparation and properties of high mol. weight polyamic esters having a cyclobutane moiety in the main chain)

RN 205655-16-9 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[(butylamino)carbonyl]-, dimethyl ester (9CI) (CA INDEX NAME)



IT 2957-97-3P, 1,2,3,4-Cyclobutanetetracarboxylic acid 1,3-dimethyl ester 205655-11-4P, 1,2,3,4-Cyclobutanetetracarboxylic acid 1,3-dimethyl ester-2,4-dichloride-hexamethylenediamine copolymer, polyamic acid sru 205655-14-7P, 1,2,3,4-Cyclobutanetetracarboxylic acid 1,3-dimethyl ester-2,4-dichloride-4,4'-oxydianiline copolymer, polyamic acid sru

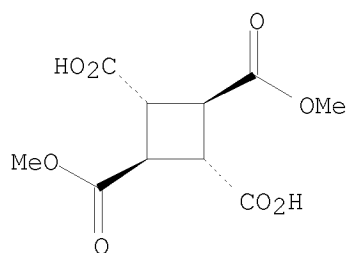
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(preparation and properties of high mol. weight polyamic esters having a cyclobutane moiety in the main chain)

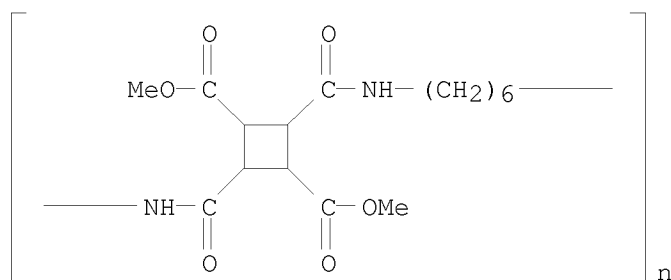
RN 2957-97-3 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,3-dimethyl ester, (1 $\alpha$ , 2 $\beta$ , 3 $\alpha$ , 4 $\beta$ )- (CA INDEX NAME)

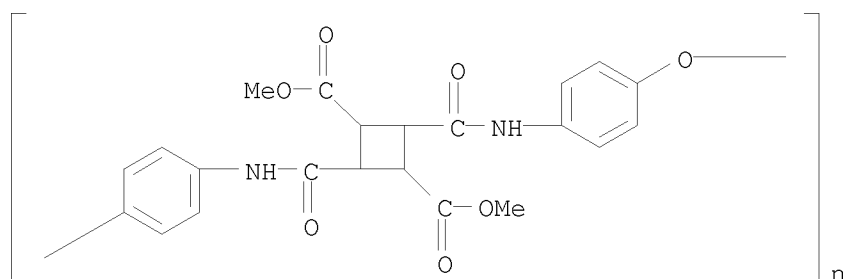
Relative stereochemistry.



RN 205655-11-4 CAPLUS  
 CN Poly[iminocarbonyl[2,4-bis(methoxycarbonyl)-1,3-cyclobutanediyl]carbonylimino-1,6-hexanediyl] (9CI) (CA INDEX NAME)



RN 205655-14-7 CAPLUS  
 CN Poly[oxy-1,4-phenyleneiminocarbonyl[2,4-bis(methoxycarbonyl)-1,3-cyclobutanediyl]carbonylimino-1,4-phenylene] (9CI) (CA INDEX NAME)



REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 6 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1997:436082 CAPLUS

DOCUMENT NUMBER: 127:50632

ORIGINAL REFERENCE NO.: 127:9661a,9664a

TITLE: Preparation of cyclic amic acid derivatives as inhibitors of protein-farnesyl transferase and antitumor agents

INVENTOR(S): Iwasawa, Yoshikazu; Aoyama, Tetsuya; Kawakami, Kumiko; Arai, Sachie; Satoh, Toshihiko; Monden, Yoshiaki

PATENT ASSIGNEE(S): Banyu Pharmaceuticals Co., Ltd., Japan

SOURCE: PCT Int. Appl., 100 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

## PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9717321	A1	19970515	WO 1996-JP3239	19961106
W: AU, CA, CN, JP, KR, US				
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
AU 9675051	A	19970529	AU 1996-75051	19961106
PRIORITY APPLN. INFO.:			JP 1995-313625	A 19951107
			WO 1996-JP3239	W 19961106
OTHER SOURCE(S):		MARPAT 127:50632		
GI				

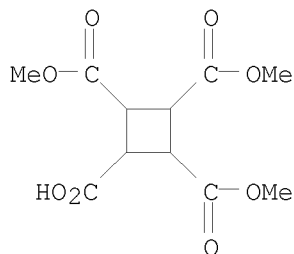
\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

AB Compds. of general formula [I; wherein Ar1, Ar2 and Ar3 = aryl or heteroaryl; Cy = aryl, heteroaryl, alicyclic; Q = (CH<sub>2</sub>)<sub>m</sub> (m = an integer of 1 to 6) or (CH<sub>2</sub>)<sub>n</sub>-W-(CH<sub>2</sub>)<sub>p</sub> (W = oxygen, sulfur, vinylene or ethynylene; n, p = an integer of 0 to 3); R1 = H, halo, OH, (un)substituted lower alkyl or alkoxy; R2, R7, R8 = H, halo, OH, lower alkyl or alkoxy; R3, R4 = H, halo, OH, NH<sub>2</sub>, NO<sub>2</sub>, cyano, CO<sub>2</sub>H, lower alkoxycarbonyl, CONH<sub>2</sub>, lower alkylcarbamoyl, lower alkyl, hydroxyalkyl, fluoroalkyl, or alkoxy; R5 = lower alkyl; R6 = H, lower alkyl; R9, R10 = H, OH, lower alkyl; R11 = OH, CO<sub>2</sub>H, lower alkyl, hydroxyalkyl, or alkoxy; p, n = an integer of 0 to 2; m = 0 or 1] or pharmaceutically acceptable salts and esters thereof are prepared. An antitumor agent containing I as the active ingredient is claimed. Thus, a 5-carbamoyl-1,3-dioxolane-2,2,4-tricarboxylic acid derivative (II; R = CHO, R12 = Me, R13 = Et) (preparation given) underwent Wittig reaction with 2-benzoxazolylmethyltriphenylphosphonium chloride using NaH in THF followed by saponification with LiOH in aqueous THF and acidification with 1 N aqueous HCl to give II (R = Q, R12 = R13 = H). The latter compound in vitro showed IC<sub>50</sub> of 0.1 nM for inhibiting protein-farnesyl transferase and 3.6 nM for inhibiting the farnesylation of Ras protein in activated ras gene-transformed NIH3T3 cells and in vivo inhibited the proliferation of activated human Ha-ras-transformed cells (NIH/ras) transplanted in mice by 23, 41, and 82% at 20, 40, and 80 mg/kg i.p.

IT 191166-13-9P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (preparation of cyclic amic acid derivs. as inhibitors of protein-farnesyl transferase and antitumor agents)

RN 191166-13-9 CAPLUS

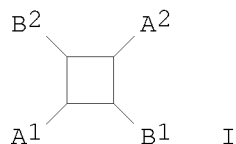
CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3-trimethyl ester (CA INDEX NAME)



REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ACCESSION NUMBER: 1997:372557 CAPLUS  
 DOCUMENT NUMBER: 127:65594  
 ORIGINAL REFERENCE NO.: 127:12539a,12542a  
 TITLE: Preparation of cyclobutanecarboxamide-derivative inhibitors of protein farnesyltransferase and squalene synthase  
 INVENTOR(S): Stein, Herman H.; Baker, William R.; Fung, Anthony K. L.; Rosenberg, Saul H.; Rockway, Todd W.; Fakhoury, Stephen A.; Garvey, David S.; Donner, B. Gregory; McClellan, William J.; O'Connor, Stephen J.; Prasad, Rajnandan; Shen, Wang; Sullivan, Gerard M.  
 PATENT ASSIGNEE(S): Abbott Laboratories, USA  
 SOURCE: U.S., 49 pp., Cont.-in-part of U.S. Ser. No. 194,366, abandoned.  
 CODEN: USXXAM  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 2  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5631401	A	19970520	US 1995-378334	19950124
AU 9520444	A	19960801	AU 1995-20444	19950601
PRIORITY APPLN. INFO.:			US 1994-194366	B2 19940209
			US 1995-378334	A 19950126
OTHER SOURCE(S):	MARPAT 127:65594			
GI				



- AB The title compds. [I; A1, A2 = CON(R1)R2; R1 = H, (un)substituted alkyl, cycloalkyl, aryl, alkenyl, alkynyl, etc.; R2 = aryl, alkenyl alkynyl, (un)substituted alkyl, etc.; NR1R2 = (un)substituted heterocyclyl; B1, B2 = CO2R7; R7 = H, carboxy-protecting group], useful for inhibiting protein farnesyltransferase and de novo squalene production resulting in the inhibition of cholesterol biosynthesis, are prepared Thus, (1 $\alpha$ , 2 $\beta$ , 3 $\beta$ , 4 $\alpha$ )-1-[N-propyl-N-(4-phenoxybenzyl)aminocarbonyl]-3-[N-benzyl-N-(4-phenoxybenzyl)aminocarbonyl]cyclobutane-2,4-dicarboxylic acid, prepared by the amidation of 1,2,3,4-cyclobutanetetracarboxylic acid dianhydride with N-propyl-4-phenoxybenzyl amine and N-benzyl-4-phenoxybenzyl amine, demonstrated a 94% inhibition of protein farnesyltransferase at 1  $\mu$ M.
- IT 171348-74-6P 171348-75-7P 171348-76-8P  
 171348-77-9P 171348-78-0P 171348-79-1P  
 171348-80-4P 171348-81-5P 171348-82-6P  
 171348-83-7P 171348-84-8P 171348-85-9P  
 171348-86-0P 171348-87-1P 171348-88-2P  
 171348-89-3P 171348-90-6P 171348-91-7P  
 171348-92-8P 171348-93-9P 171348-94-0P  
 171348-95-1P 171348-97-3P 171348-98-4P  
 171348-99-5P 171349-00-1P 171349-01-2P  
 171349-02-3P 171349-03-4P 171349-04-5P  
 171349-05-6P 171349-06-7P 171349-09-0P

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 191284-63-6P 191284-65-8P 191284-67-0P  
 191284-74-9P

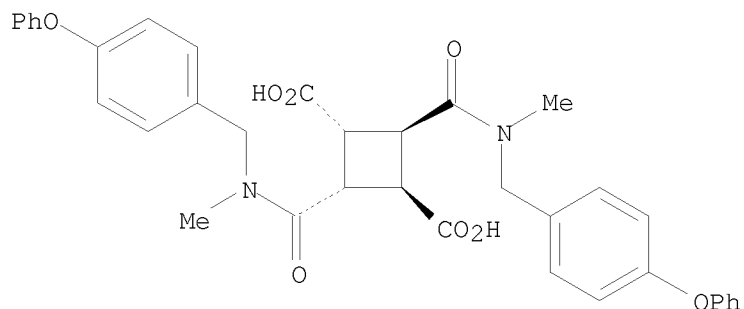
RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)

(preparation of cyclobutanecarboxamide-derivative inhibitors of protein farnesyltransferase and squalene synthase)

RN 171348-74-6 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[methyl[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

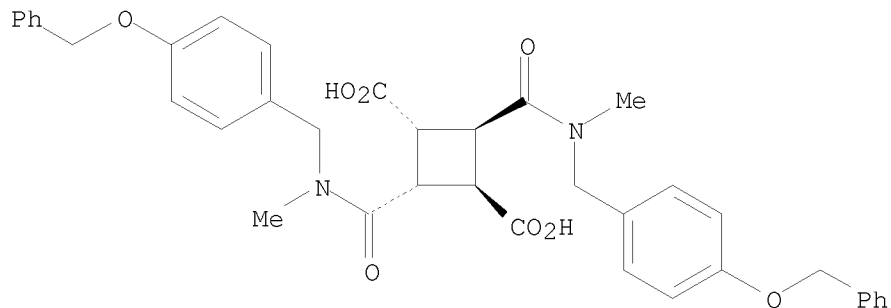
Relative stereochemistry.



RN 171348-75-7 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[methyl[[4-(phenylmethoxy)phenyl]methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

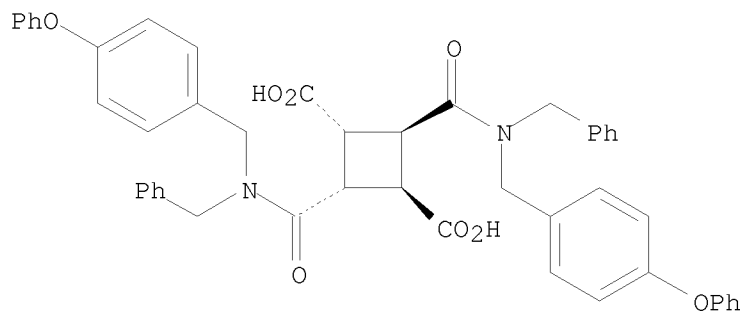
Relative stereochemistry.



RN 171348-76-8 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(4-phenoxyphenyl)methyl](phenylmethyl)amino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (CA INDEX NAME)

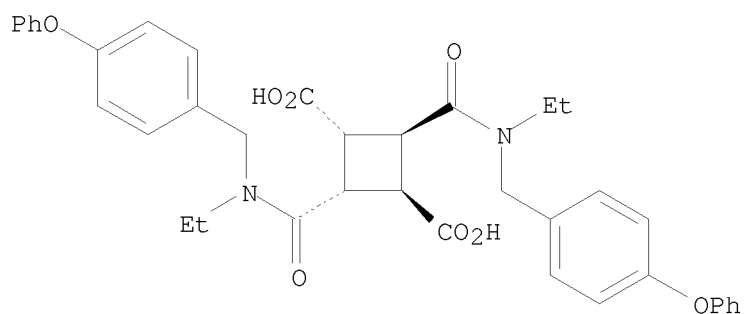
Relative stereochemistry.



RN 171348-77-9 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[ethyl[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (CA INDEX NAME)

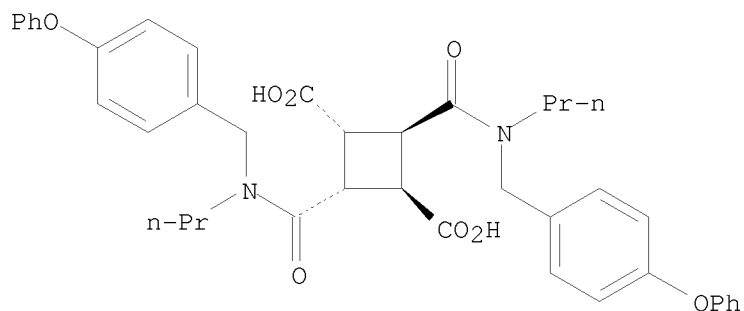
Relative stereochemistry.



RN 171348-78-0 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.

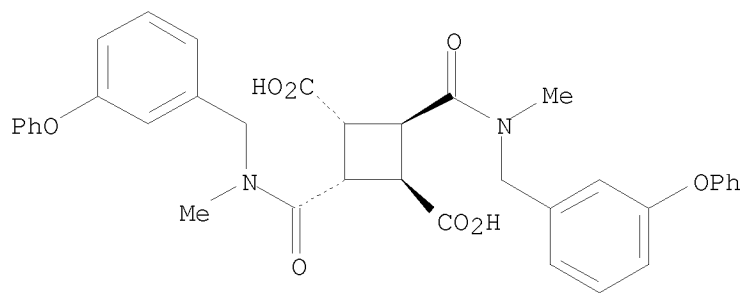


RN 171348-79-1 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[methyl[(3-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (CA INDEX NAME)

(1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (9CI) (CA INDEX NAME)

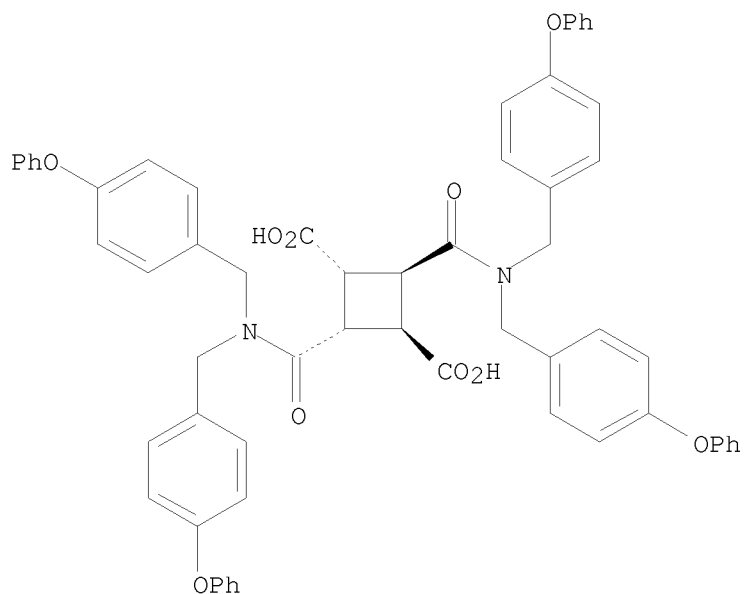
Relative stereochemistry.



RN 171348-80-4 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[bis[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.

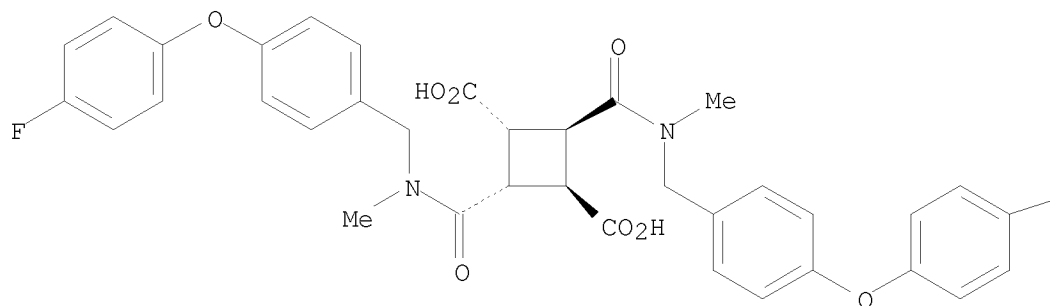


RN 171348-81-5 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(4-fluorophenoxy)phenyl]methyl]methylamino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.

PAGE 1-A



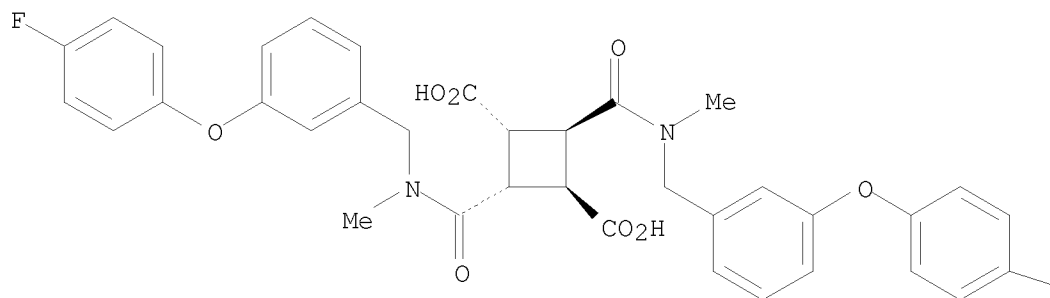
PAGE 1-B

—F

RN 171348-82-6 CAPLUS  
CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[3-(4-fluorophenoxy)phenyl]methyl]methylamino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.

PAGE 1-A



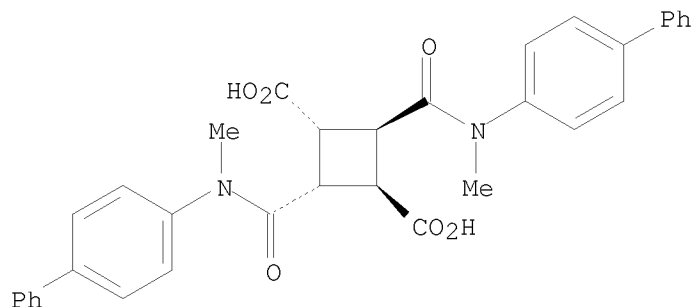
PAGE 1-B

—F

RN 171348-83-7 CAPLUS  
CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[([1,1'-biphenyl]-4-

ylmethylamino)carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (9CI) (CA  
INDEX NAME)

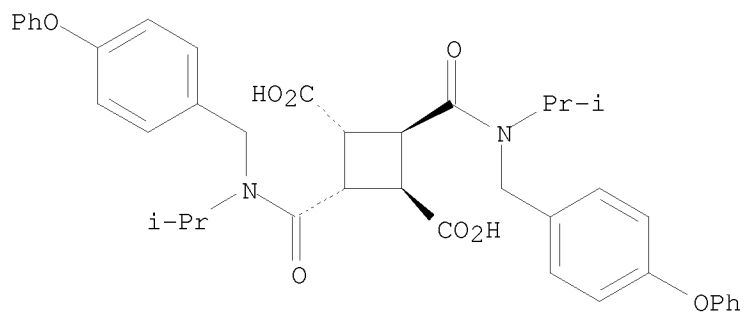
Relative stereochemistry.



RN 171348-84-8 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(1-methylethyl)[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (9CI) (CA INDEX NAME)

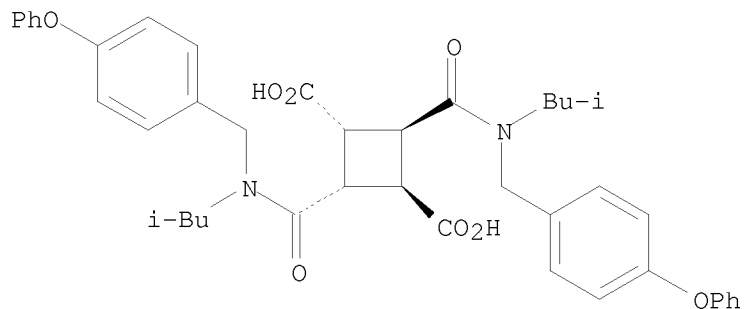
Relative stereochemistry.



RN 171348-85-9 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-methylpropyl)[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (CA INDEX NAME)

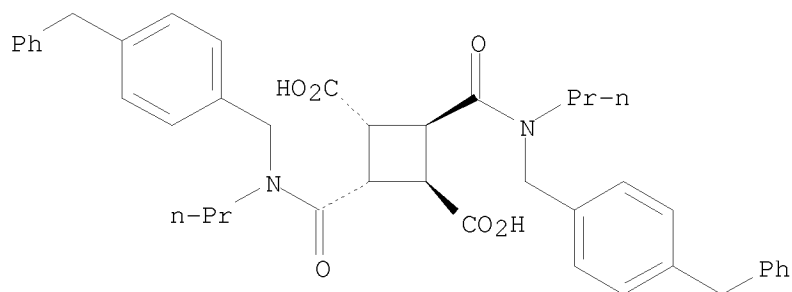
Relative stereochemistry.



RN 171348-86-0 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(phenylmethyl)phenyl)methyl]propylamino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (9CI) (CA INDEX NAME)

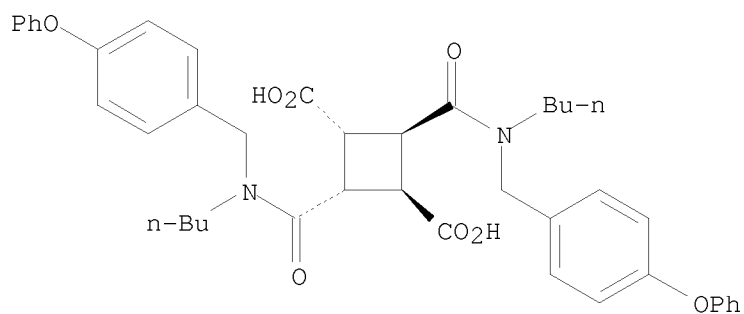
Relative stereochemistry.



RN 171348-87-1 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[butyl[(4-phenoxymethyl)phenyl]methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

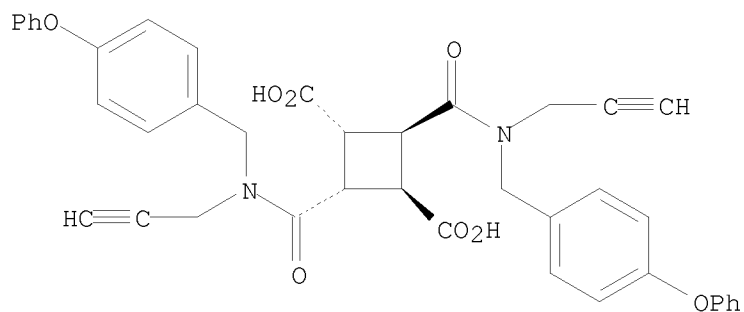
Relative stereochemistry.



RN 171348-88-2 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[2-(4-phenoxyphenyl)propynyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

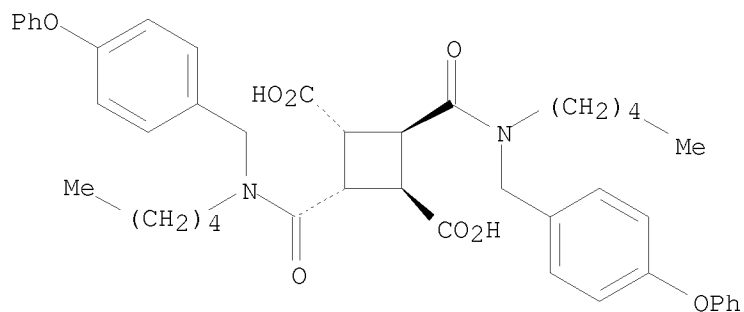
Relative stereochemistry.



RN 171348-89-3 CAPLUS

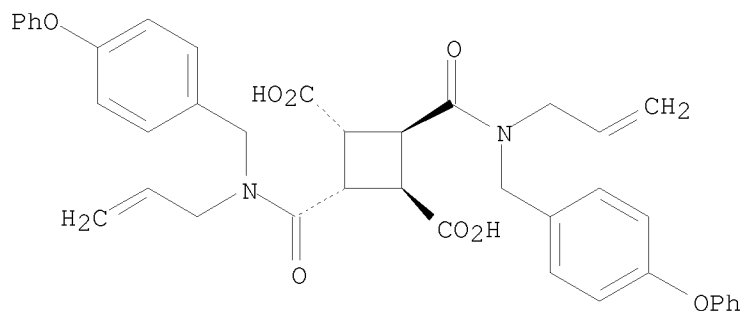
CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[pentyl[(4-phenoxymethyl)phenyl]methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.



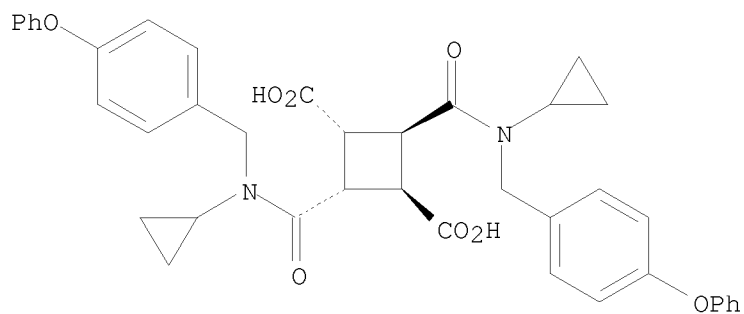
RN 171348-90-6 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-phenoxyphenyl)methyl]-2-propen-1-ylamino]carbonyl-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



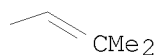
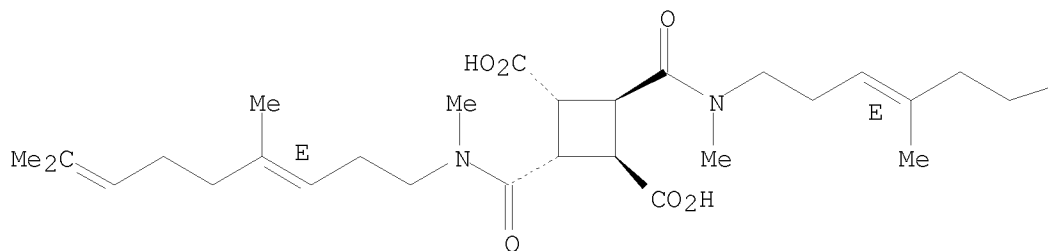
RN 171348-91-7 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[cyclopropyl[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.



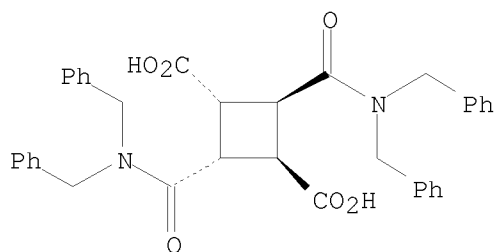
RN 171348-92-8 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[cyclopropyl[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.  
 Double bond geometry as shown.



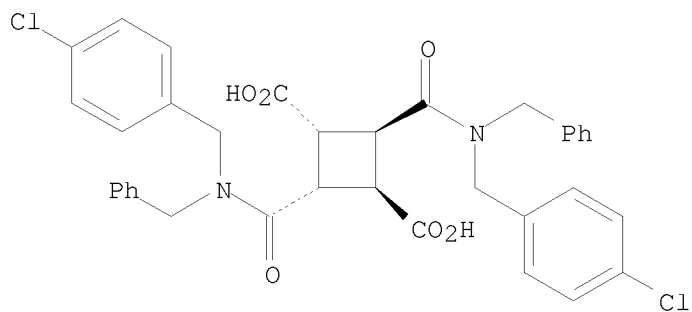
RN 171348-93-9 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[bis(phenylmethyl)amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



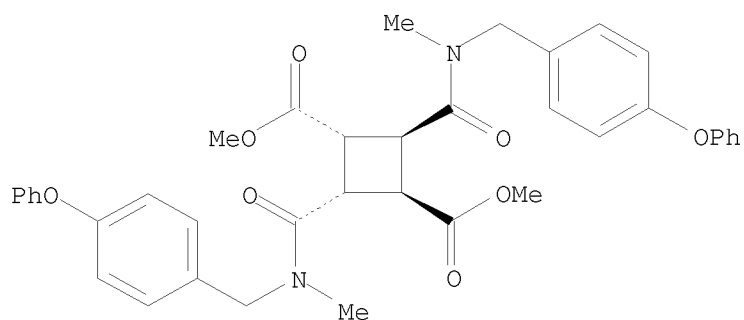
RN 171348-94-0 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(4-chlorophenyl)methyl](phenylmethyl)amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



RN 171348-95-1 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[methyl[(4-phenoxyphenyl)methyl]amino]carbonyl]-, dimethyl ester, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

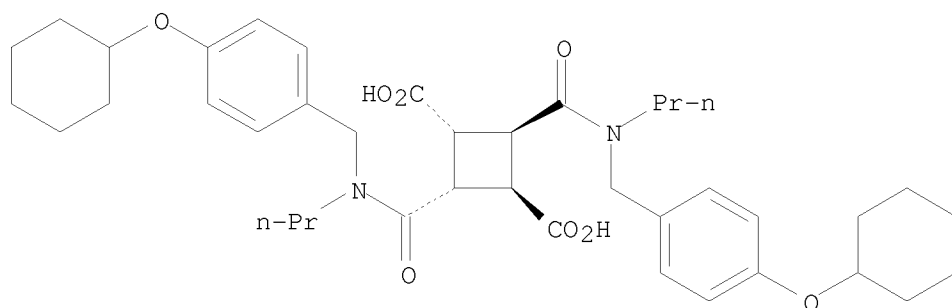
Relative stereochemistry.



RN 171348-97-3 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(cyclohexyloxy)phenyl]methyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

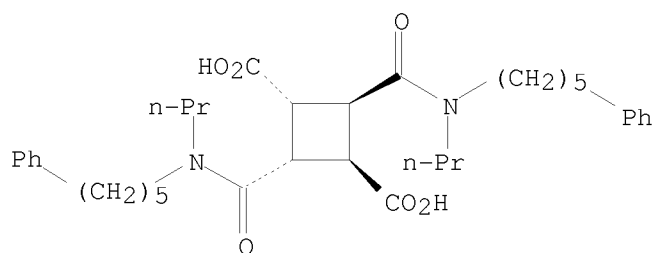
Relative stereochemistry.



RN 171348-98-4 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[5-phenylpentyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

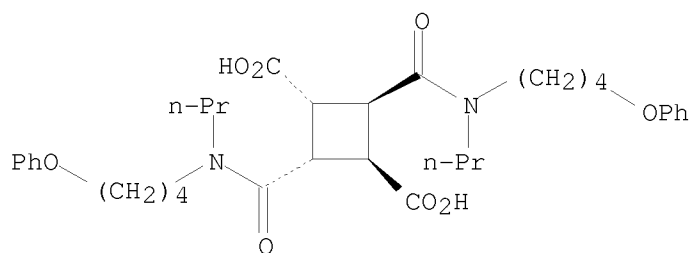
Relative stereochemistry.



RN 171348-99-5 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-phenoxybutyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

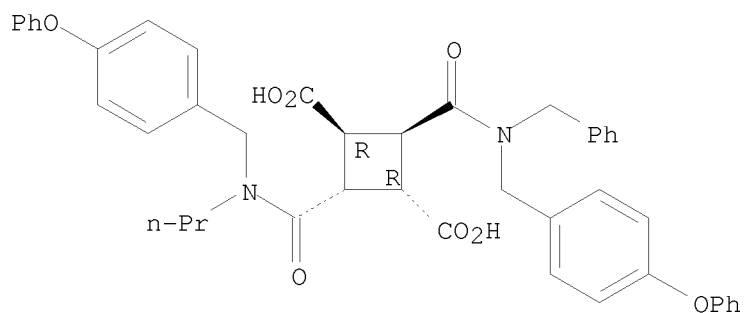
Relative stereochemistry.



RN 171349-00-1 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2-[[[(4-phenoxyphenyl)methyl](phenylmethyl)amino]carbonyl]-4-[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.

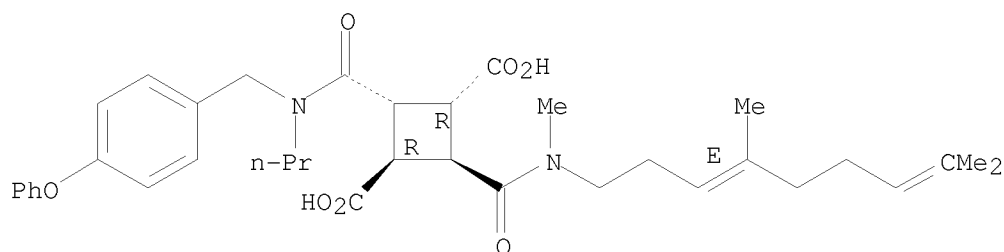


RN 171349-01-2 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2-[[[(4,8-dimethyl-3,7-nonadienyl)methylamino]carbonyl]-4-[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, stereoisomer (9CI) (CA INDEX NAME)

Relative stereochemistry.

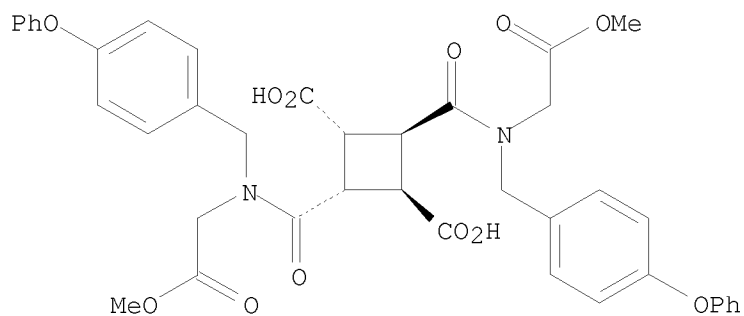
Double bond geometry as shown.



RN 171349-02-3 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(2-methoxy-2-oxoethyl)[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (CA INDEX NAME)

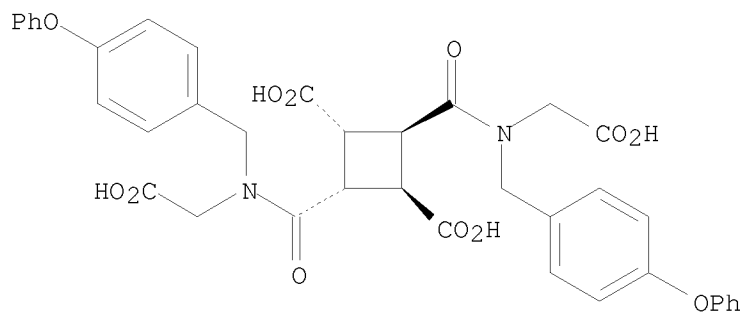
Relative stereochemistry.



RN 171349-03-4 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(carboxymethyl)[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

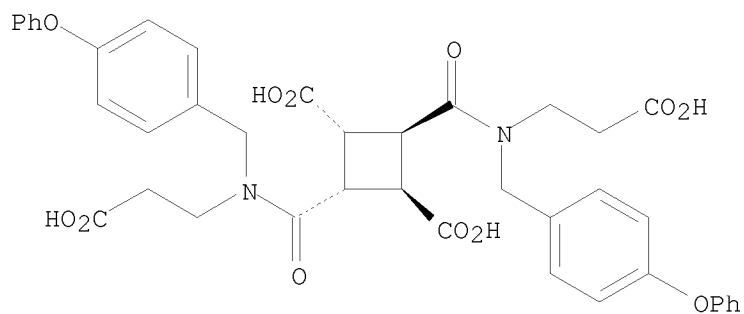
Relative stereochemistry.



RN 171349-04-5 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-carboxyethyl)[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

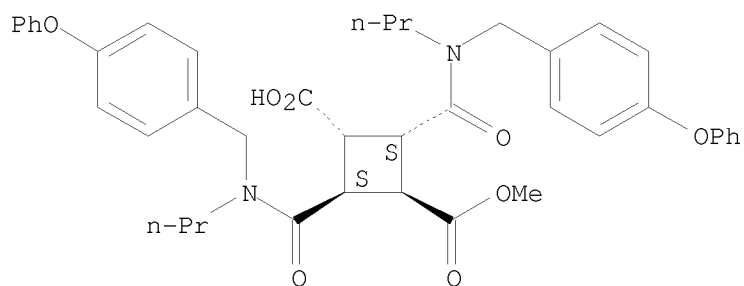
Relative stereochemistry.



RN 171349-05-6 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, monomethyl ester, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

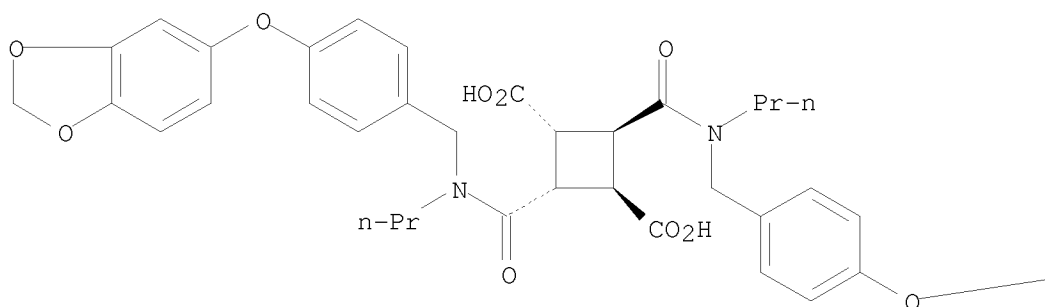
Relative stereochemistry.



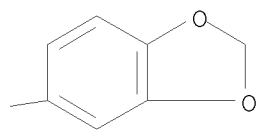
RN 171349-06-7 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(1,3-benzodioxol-5-yloxy)phenyl]methyl]propylamino]carbonyl]-,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.

PAGE 1-A

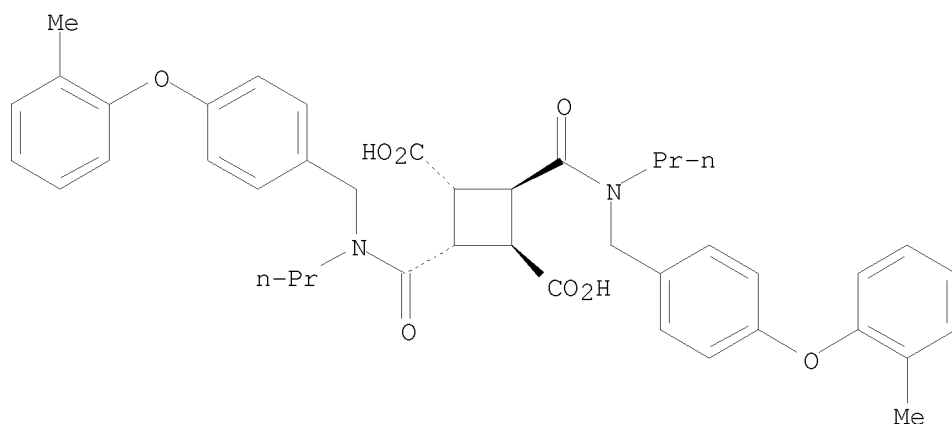


PAGE 1-B



RN 171349-09-0 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(2-methylphenoxy)phenyl]methyl]propylamino]carbonyl]-,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

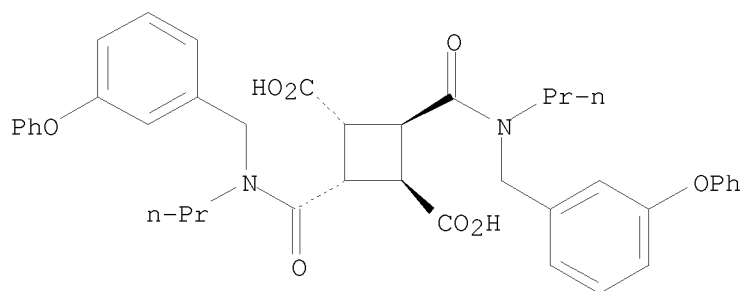
Relative stereochemistry.



RN 171349-10-3 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(3-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

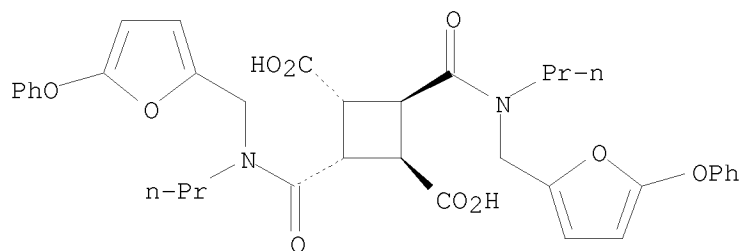
Relative stereochemistry.



RN 171349-11-4 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(5-phenoxy-2-thienyl)methyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

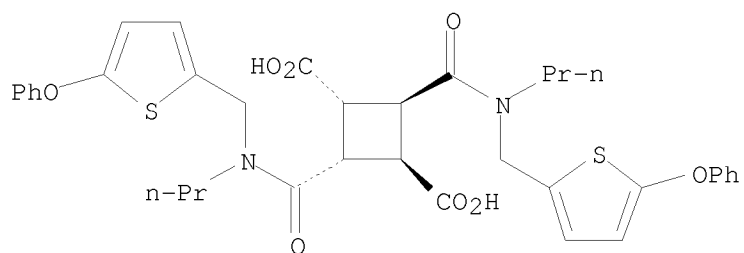
Relative stereochemistry.



RN 171349-12-5 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(5-phenoxy-2-thienyl)methyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

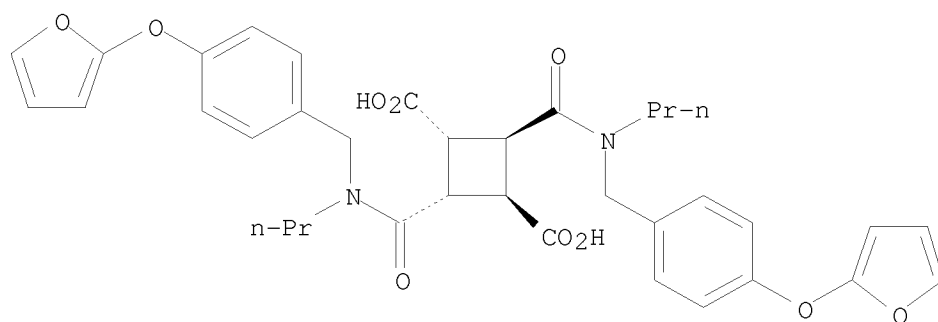
Relative stereochemistry.



RN 171349-13-6 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(2-furanyloxy)phenyl]methyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

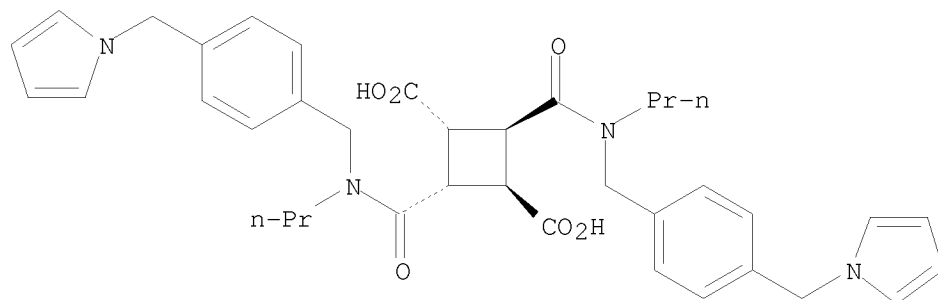
Relative stereochemistry.



RN 171349-15-8 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[propyl[[4-(1H-pyrrol-1-ylmethyl)phenyl]methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

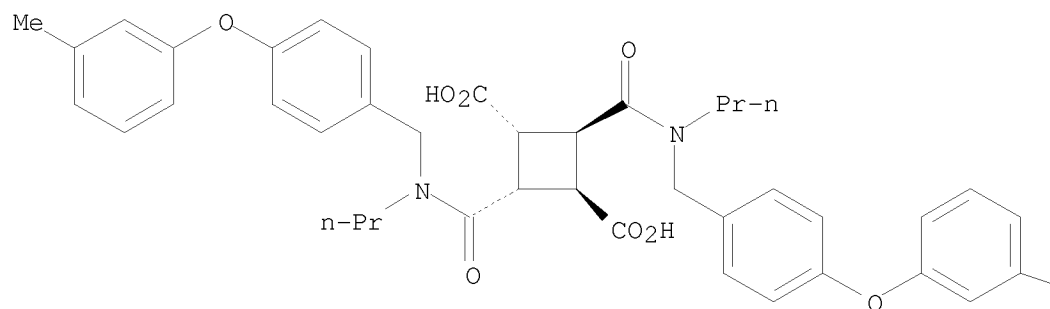
Relative stereochemistry.



RN 171349-16-9 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(3-methylphenoxy)phenyl]methyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.

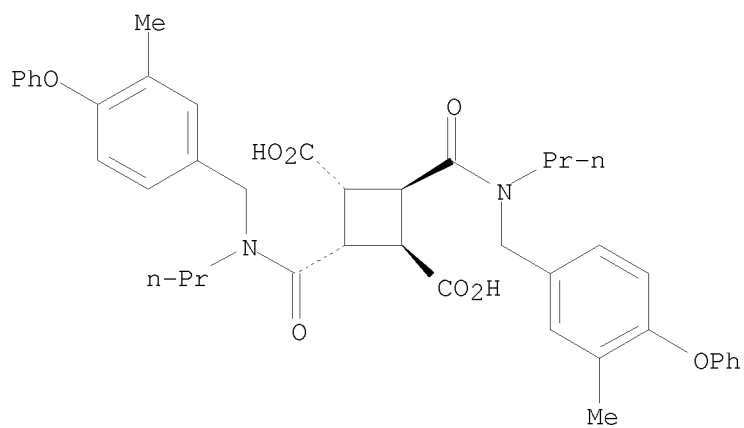


Me

RN 171349-18-1 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(3-methyl-4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

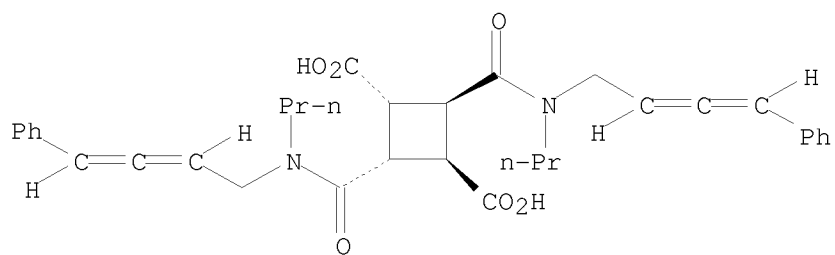
Relative stereochemistry.



RN 171349-19-2 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-phenyl-2,3-butadien-1-yl)propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

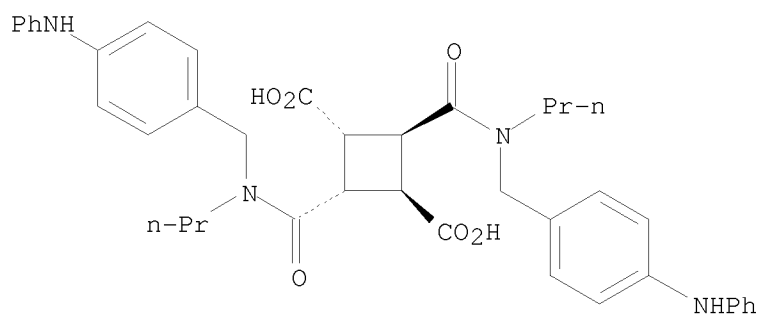
Relative stereochemistry.



RN 171349-21-6 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(phenylamino)phenyl]methyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

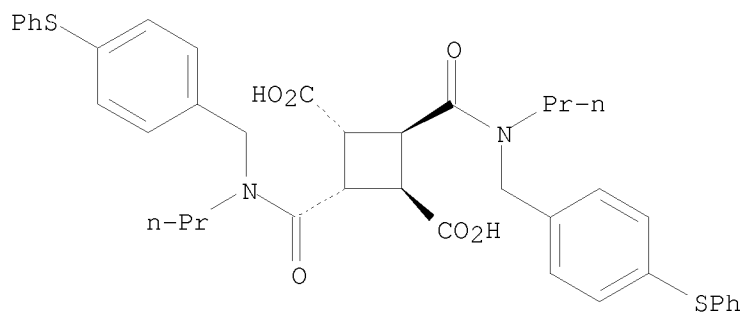
Relative stereochemistry.



RN 171349-22-7 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(phenylthio)phenyl]methyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

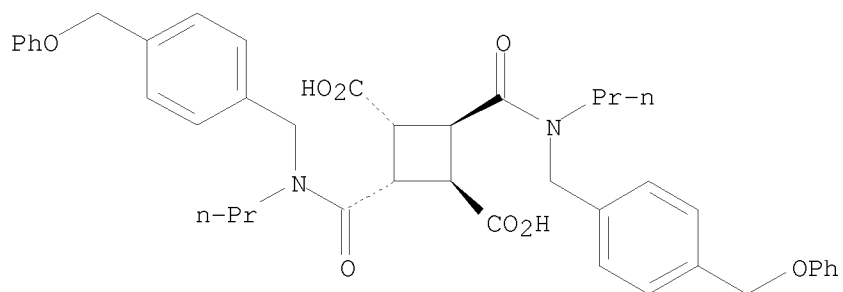
Relative stereochemistry.



RN 171349-23-8 CAPLUS

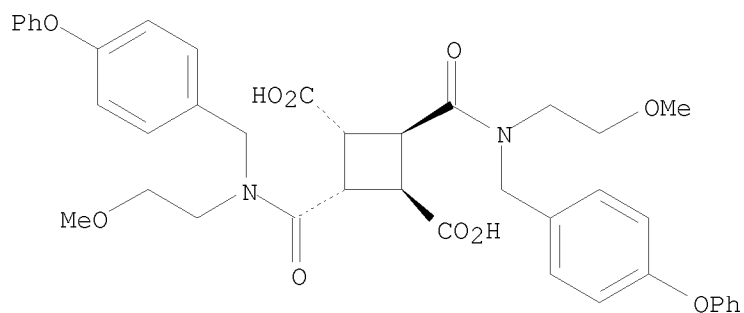
CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(phenoxy)phenyl]methyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



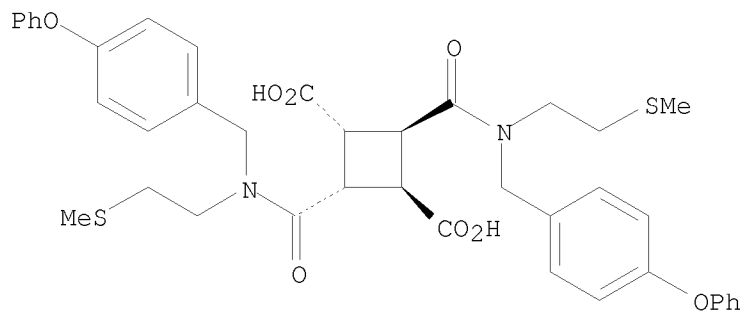
RN 171349-24-9 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-methoxyethyl)[(4-phenoxyphenyl)methyl]amino]carbonyl]-,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



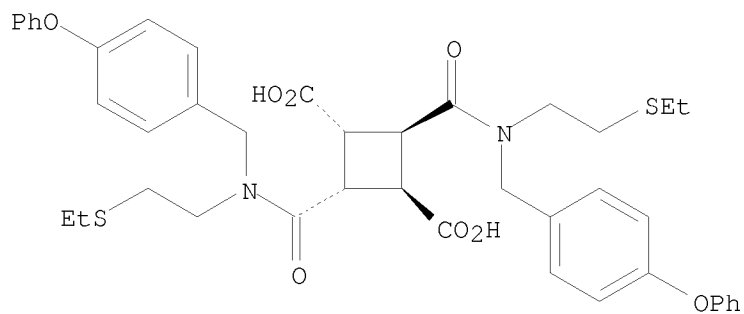
RN 171349-25-0 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-(methylthio)ethyl)[(4-phenoxyphenyl)methyl]amino]carbonyl]-,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



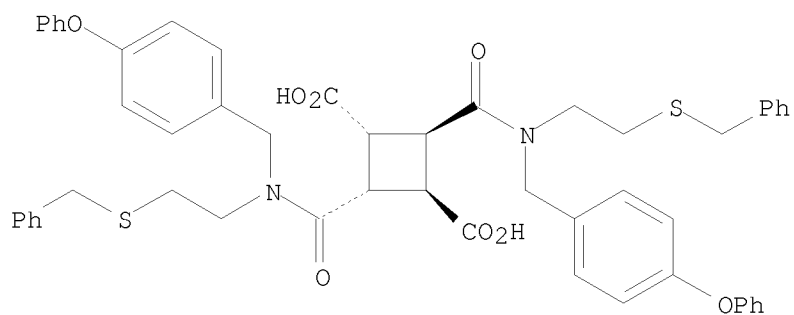
RN 171349-26-1 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-(ethylthio)ethyl)[(4-phenoxyphenyl)methyl]amino]carbonyl]-,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



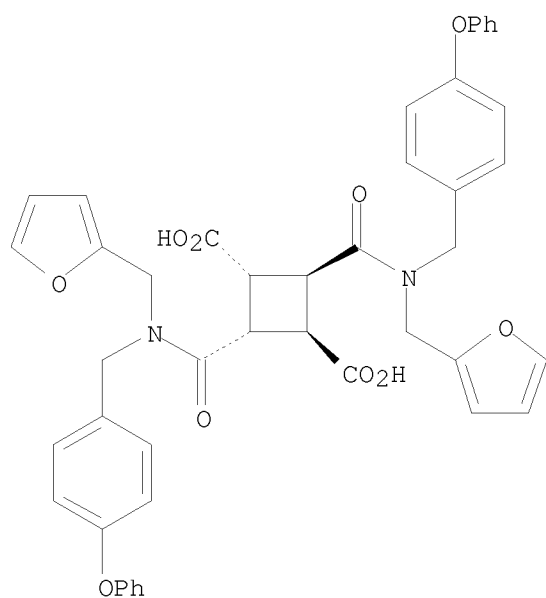
RN 171349-27-2 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-phenoxyphenyl)methyl][2-  
 [(phenylmethyl)thio]ethyl]amino]carbonyl]-,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.



RN 171349-28-3 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-furanylmethyl)[(4-  
 phenoxyphenyl)methyl]amino]carbonyl]-,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

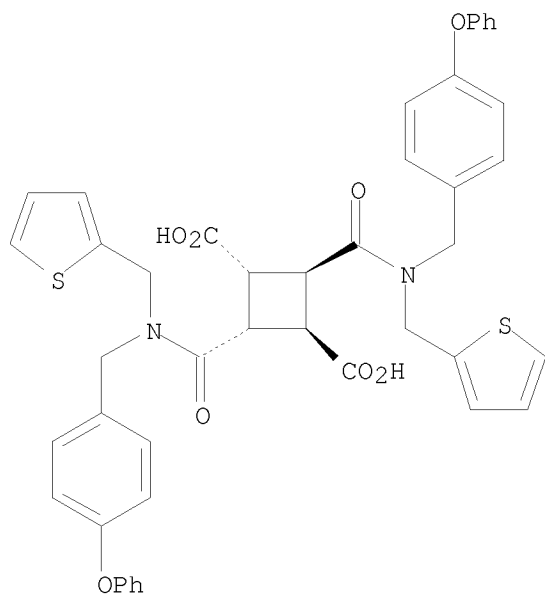
Relative stereochemistry.



RN 171349-29-4 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(4-phenoxyphenyl)methyl](2-thienylmethyl)amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

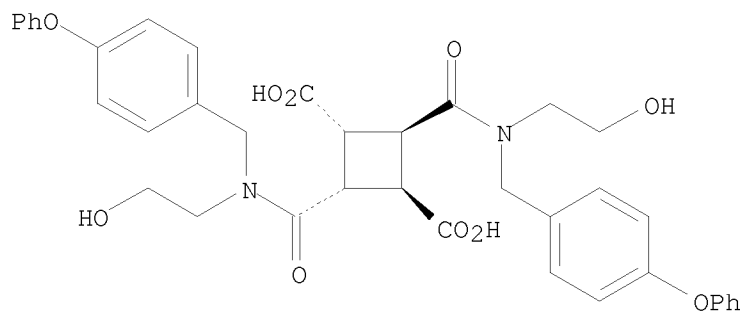
Relative stereochemistry.



RN 171349-30-7 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[ (2-hydroxyethyl) [(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

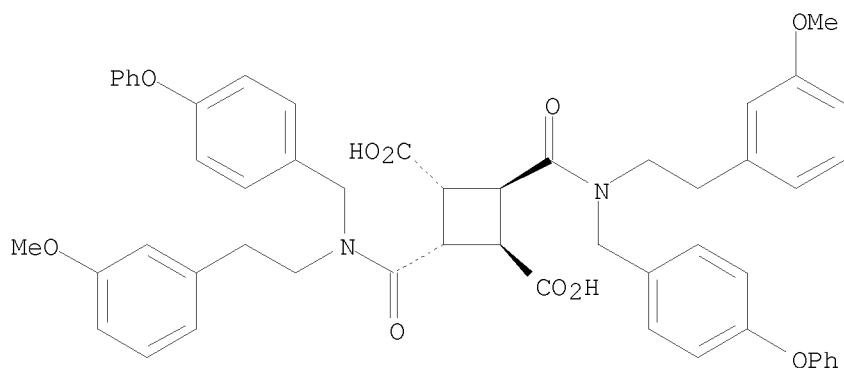
Relative stereochemistry.



RN 171349-31-8 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[2-(3-methoxyphenyl)ethyl] [(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

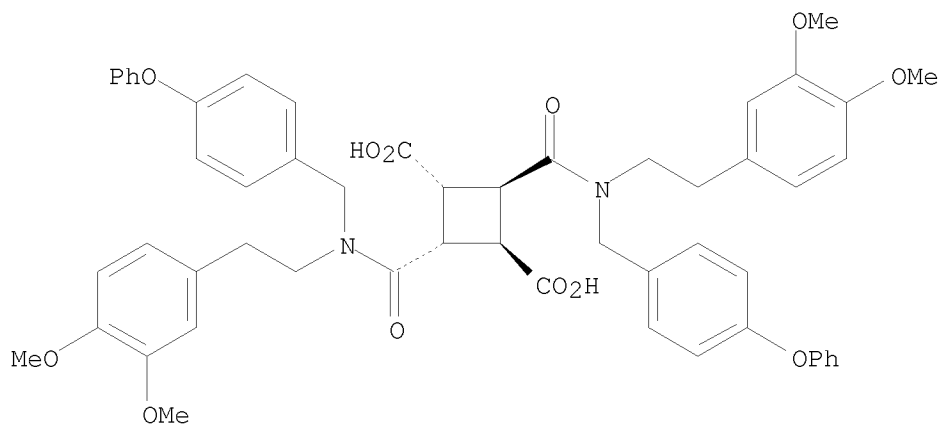
Relative stereochemistry.



RN 171349-32-9 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[2-(3,4-dimethoxyphenyl)ethyl][(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

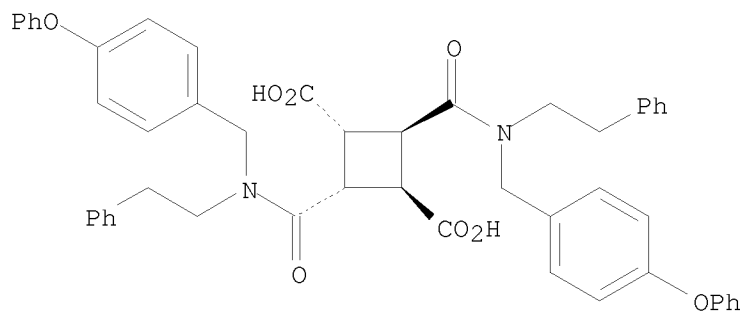
Relative stereochemistry.



RN 171349-33-0 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(4-phenoxyphenyl)methyl](2-phenylethyl)amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

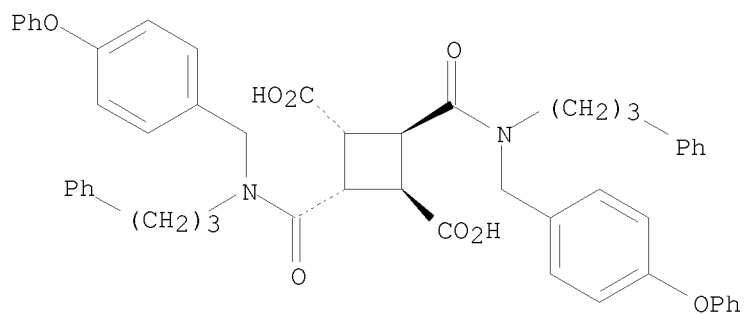
Relative stereochemistry.



RN 171349-34-1 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(4-phenoxyphenyl)methyl](3-phenylpropyl)amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

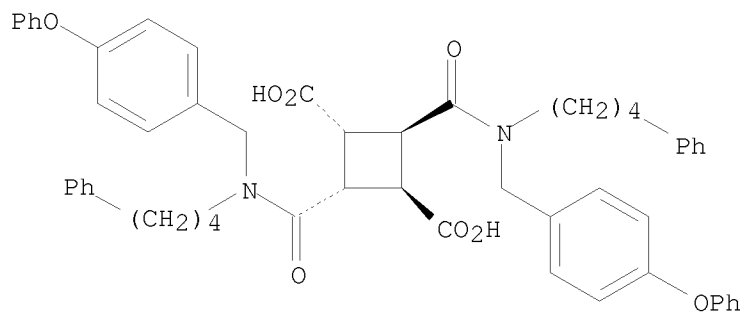
Relative stereochemistry.



RN 171349-35-2 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-phenoxyphenyl)methyl](4-phenylbutyl)amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

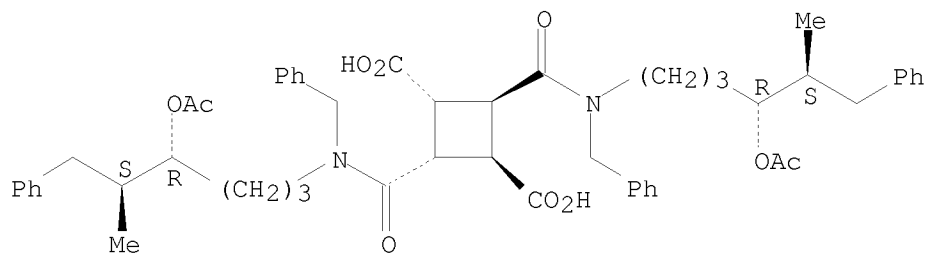
Relative stereochemistry.



RN 171349-39-6 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-(acetyloxy)-5-methyl-6-phenylhexyl)(phenylmethyl)amino]carbonyl]-, [1 $\alpha$ ,2 $\alpha$ (4R\*,5S\*),3 $\beta$ ,4 $\beta$ (4R\*,5S\*)]- (9CI) (CA INDEX NAME)

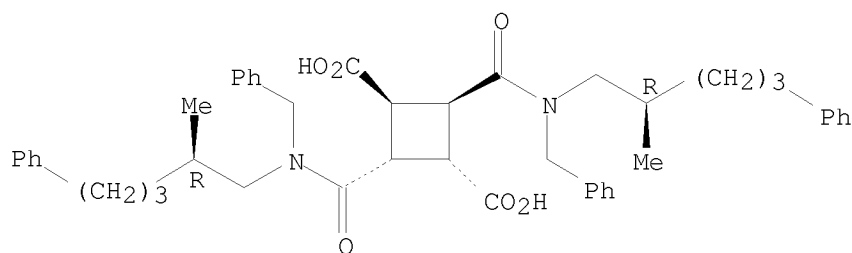
Relative stereochemistry.



RN 171349-40-9 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2R)-2-methyl-5-phenylpentyl](phenylmethyl)amino]carbonyl]-, (1 $\alpha$ ,2 $\beta$ ,3 $\beta$ ,4 $\alpha$ )- (CA INDEX NAME)

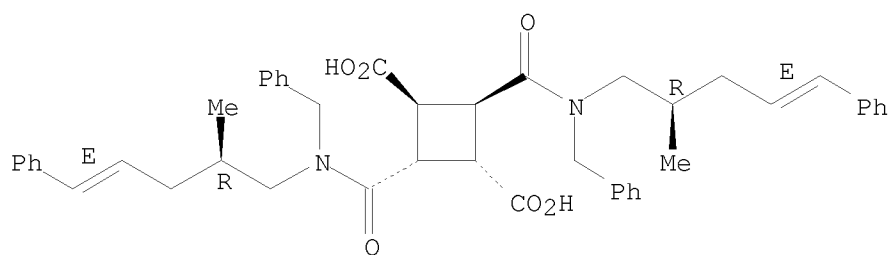
Absolute stereochemistry.



RN 171349-41-0 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2R,4E)-2-methyl-5-phenyl-4-penten-1-yl] (phenylmethyl)amino]carbonyl]-, (1 $\alpha$ ,2 $\beta$ ,3 $\beta$ ,4 $\alpha$ )- (CA INDEX NAME)

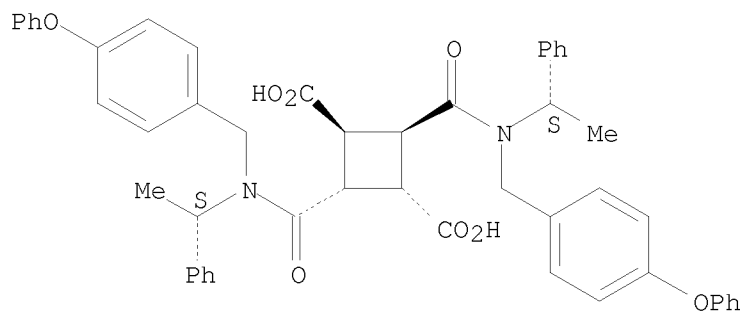
Absolute stereochemistry.  
Double bond geometry as shown.



RN 171349-42-1 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-phenoxyphenyl)methyl] [(1S)-1-phenylethyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

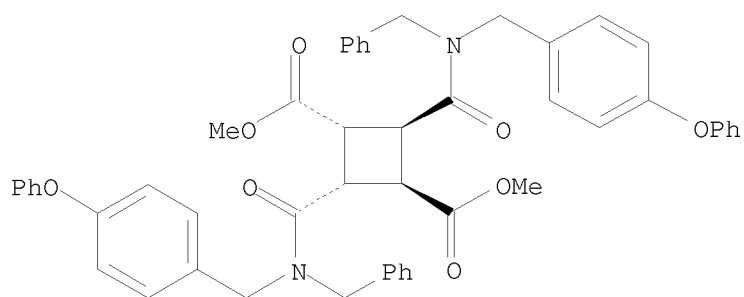
Absolute stereochemistry.



RN 171349-43-2 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-phenoxyphenyl)methyl] (phenylmethyl)amino]carbonyl]-, dimethyl ester, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

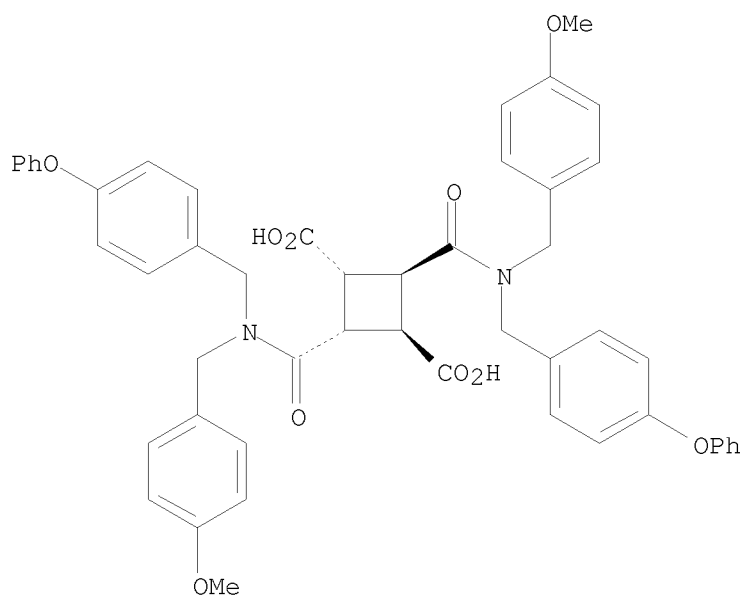
Relative stereochemistry.



RN 171349-44-3 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(4-methoxyphenyl)methyl][(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

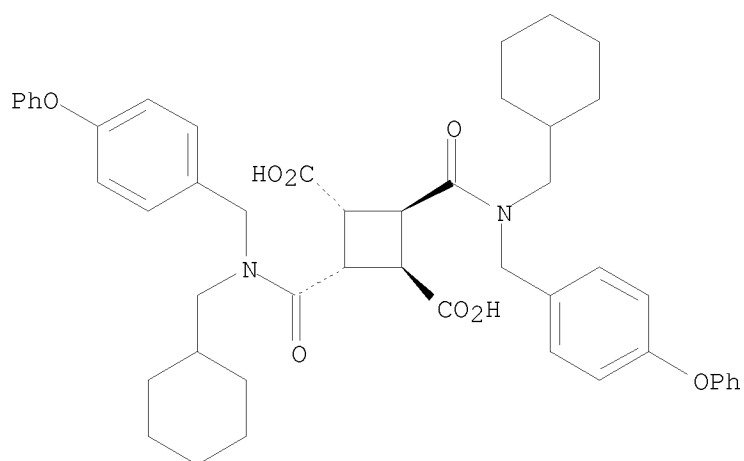
Relative stereochemistry.



RN 171349-45-4 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(cyclohexylmethyl][(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

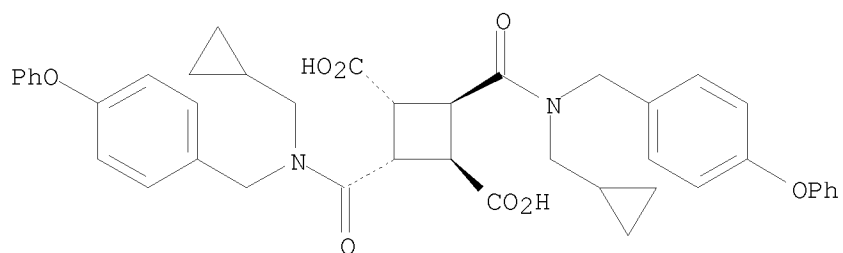
Relative stereochemistry.



RN 171349-47-6 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(cyclopropylmethyl)[(4-phenoxyphenyl)methyl]amino]carbonyl]-,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

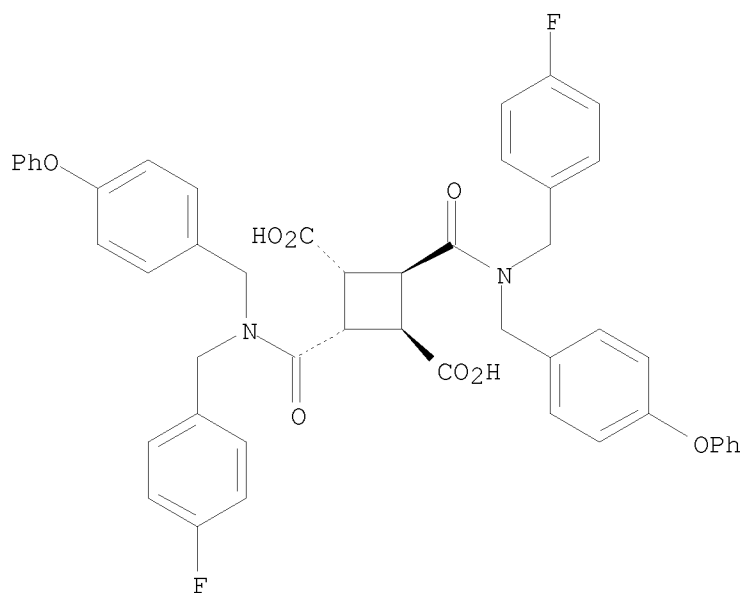
Relative stereochemistry.



RN 171349-48-7 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-fluorophenyl)methyl][(4-phenoxyphenyl)methyl]amino]carbonyl]-,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

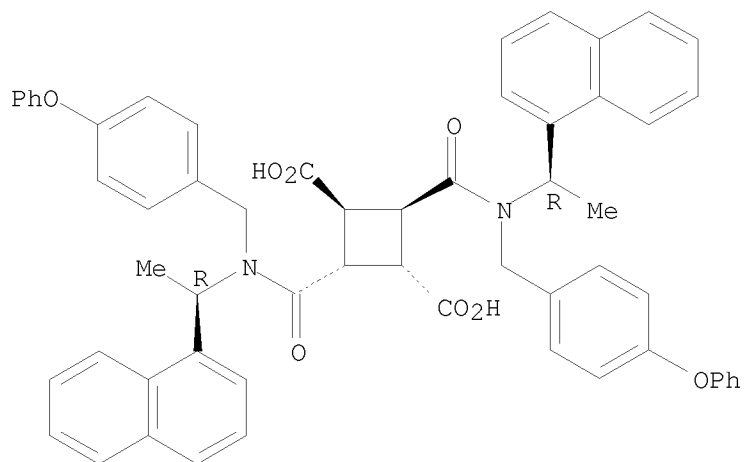
Relative stereochemistry.



RN 171349-50-1 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(1R)-1-(1-naphthalenyl)ethyl][ (4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

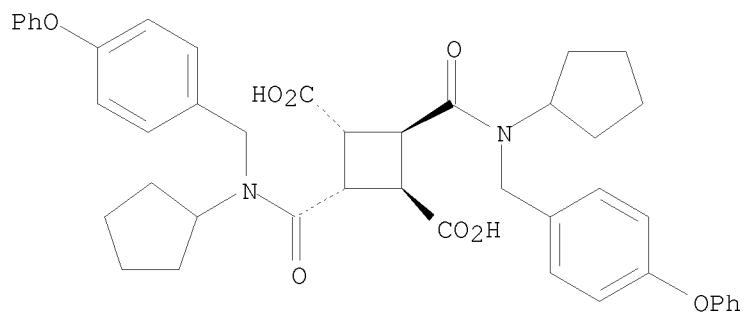
Absolute stereochemistry.



RN 171349-51-2 CAPLUS

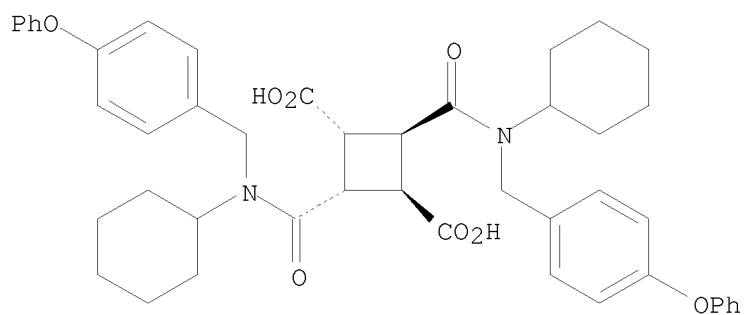
CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[cyclopentyl[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



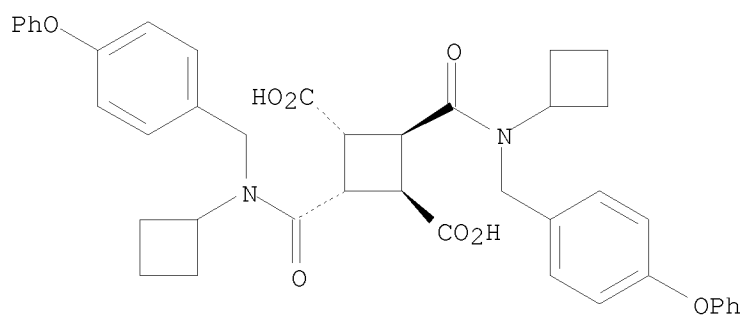
RN 171349-52-3 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[cyclohexyl[(4-phenoxyphenyl)methyl]amino]carbonyl]-,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



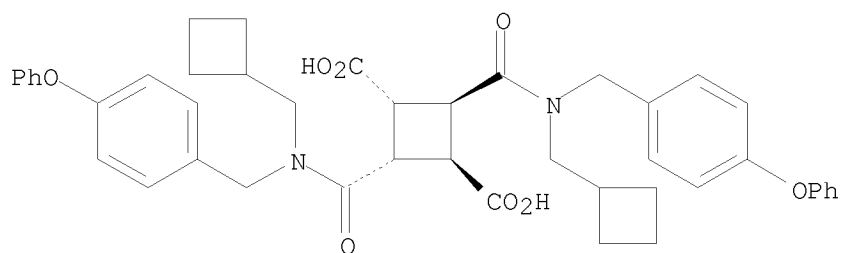
RN 171349-53-4 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[cyclobutyl[(4-phenoxyphenyl)methyl]amino]carbonyl]-,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



RN 171349-54-5 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[cyclobutylmethyl[(4-phenoxyphenyl)methyl]amino]carbonyl]-,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

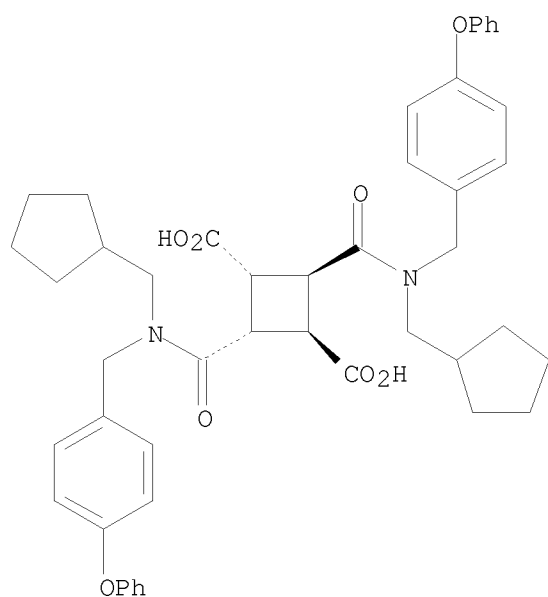
Relative stereochemistry.



RN 171349-55-6 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(cyclopentylmethyl) [(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

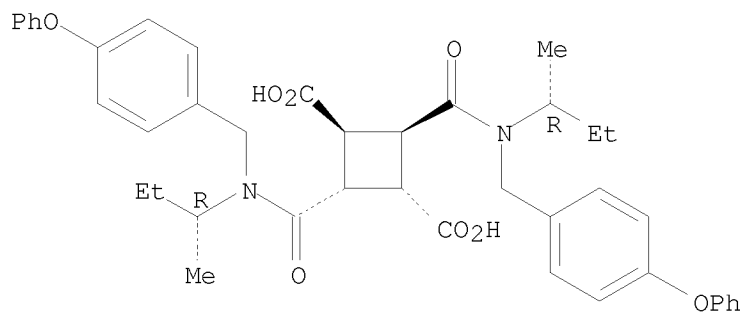
Relative stereochemistry.



RN 171349-56-7 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(1R)-1-methylpropyl] [(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Absolute stereochemistry.

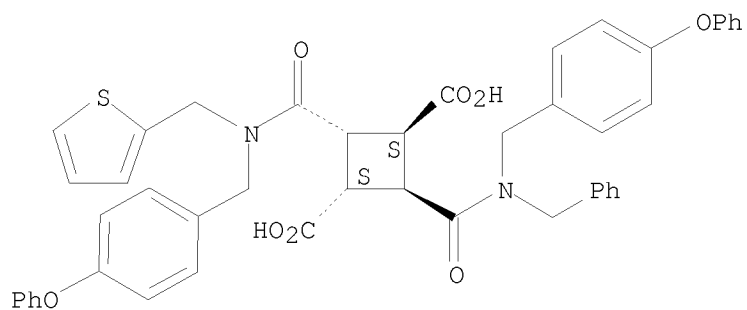


RN 171349-57-8 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2-[[[(4-

phenoxyphenyl)methyl] (phenylmethyl)amino]carbonyl]-4-[[[(4-phenoxyphenyl)methyl] (2-thienylmethyl)amino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (9CI) (CA INDEX NAME)

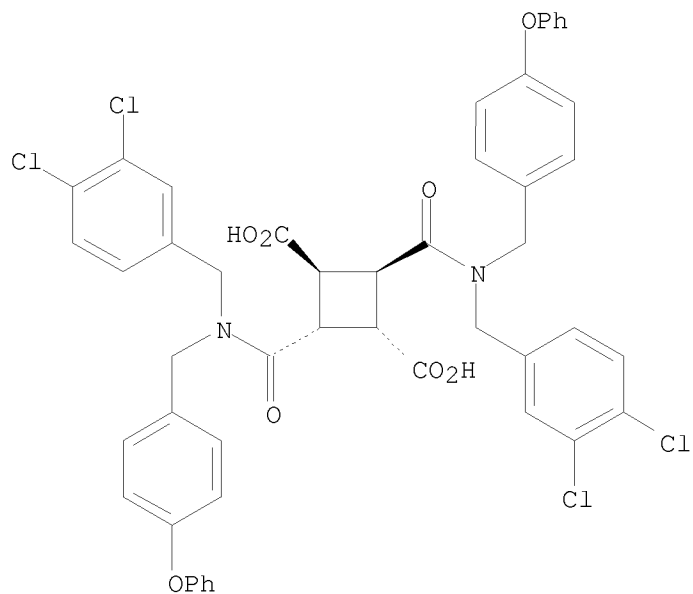
Relative stereochemistry.



RN 171349-58-9 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(3,4-dichlorophenyl)methyl] [(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (CA INDEX NAME)

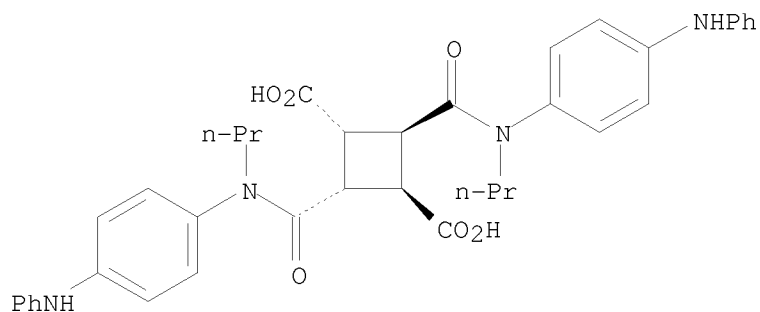
Relative stereochemistry.



RN 171483-66-2 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(phenylamino)phenyl]propylamino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (CA INDEX NAME)

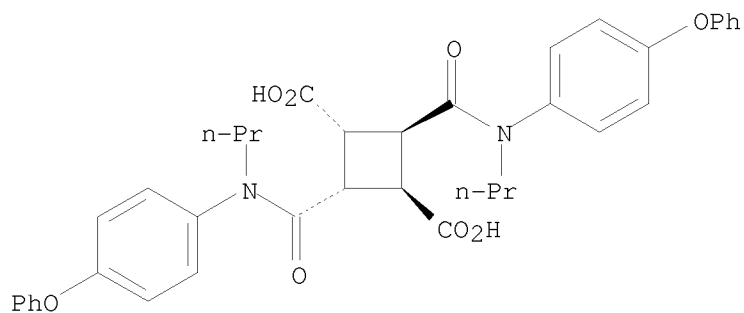
Relative stereochemistry.



RN 171483-67-3 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-phenoxyphenyl)propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

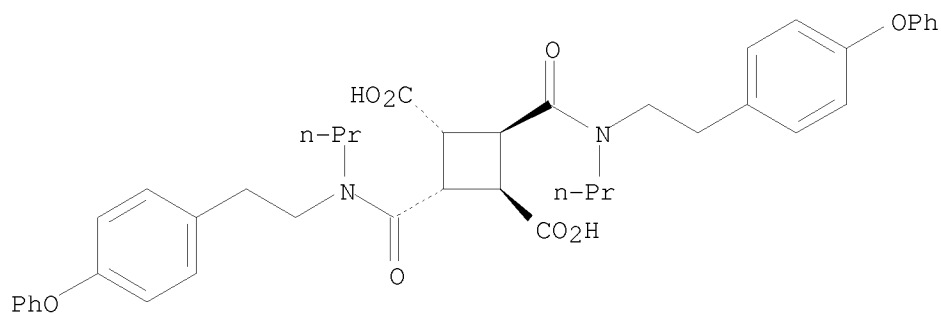
Relative stereochemistry.



RN 171483-68-4 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-(4-phenoxyphenyl)ethyl)propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

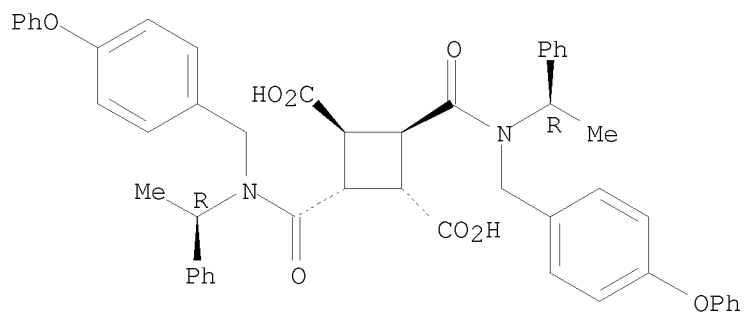
Relative stereochemistry.



RN 171483-69-5 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-phenoxyphenyl)methyl][(1R)-1-phenylethyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\beta$ ,3 $\beta$ ,4 $\alpha$ )- (CA INDEX NAME)

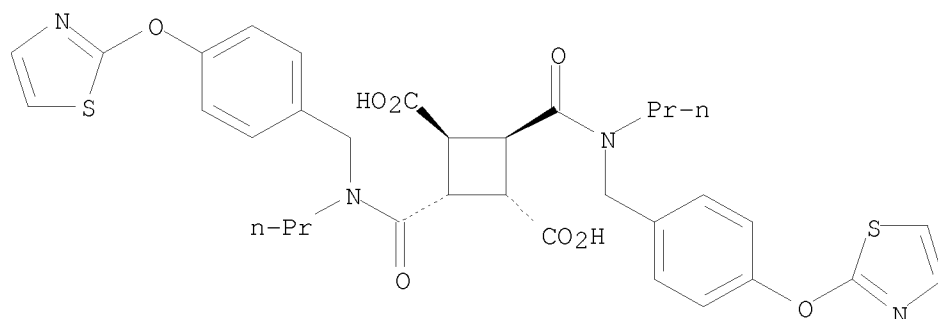
Absolute stereochemistry.



RN 191284-57-8 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[propyl[[4-(2-thiazolyloxy)phenyl]methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.

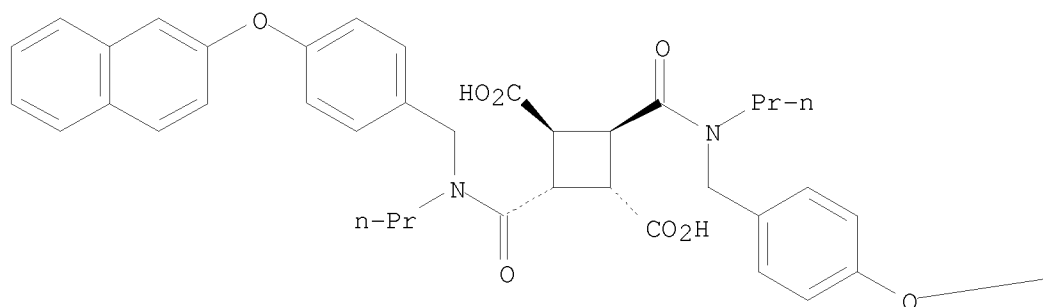


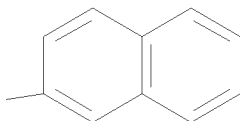
RN 191284-59-0 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(2-naphthalenyloxy)phenyl]methyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.

PAGE 1-A

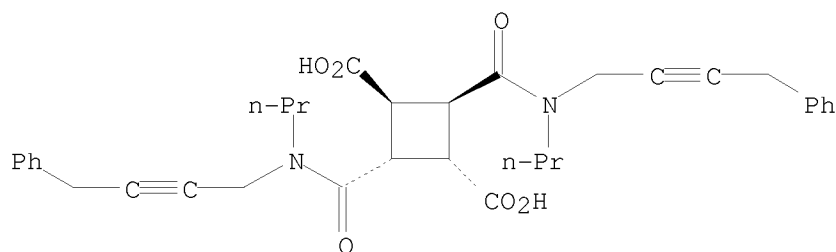




RN 191284-61-4 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[4-phenyl-2-butyne-1-yl)propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

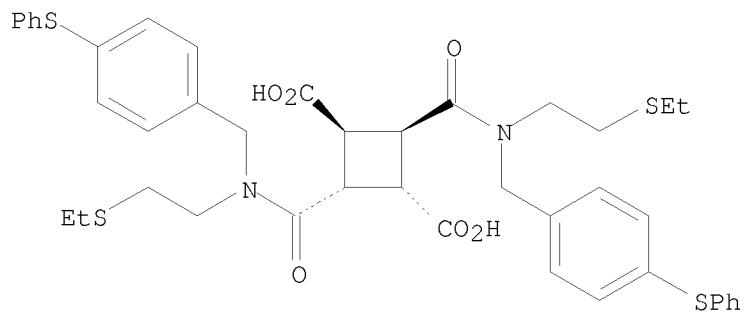
Relative stereochemistry.



RN 191284-63-6 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[2-(ethylthio)ethyl][[4-(phenylthio)phenyl]methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\beta$ ,3 $\beta$ ,4 $\alpha$ )- (CA INDEX NAME)

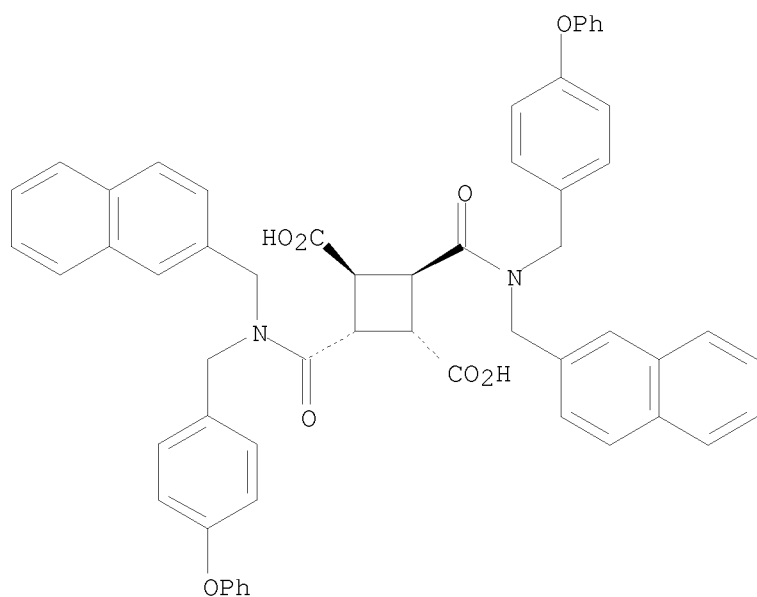
Relative stereochemistry.



RN 191284-65-8 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[2-naphthalenylmethyl][4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

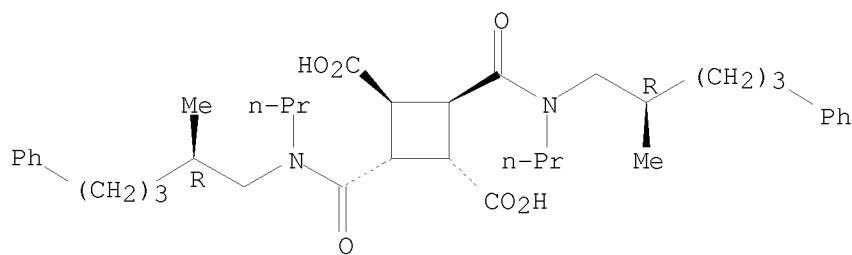
Relative stereochemistry.



RN 191284-67-0 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2R)-2-methyl-5-phenylpentyl]propylamino]carbonyl-, (1 $\alpha$ ,2 $\beta$ ,3 $\beta$ ,4 $\alpha$ )- (CA INDEX NAME)

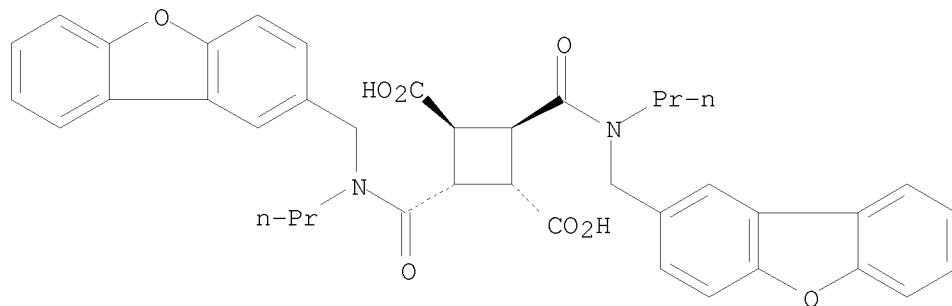
Absolute stereochemistry.



RN 191284-74-9 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-dibenzofuranylmethyl)propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



IT 171349-59-0P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT

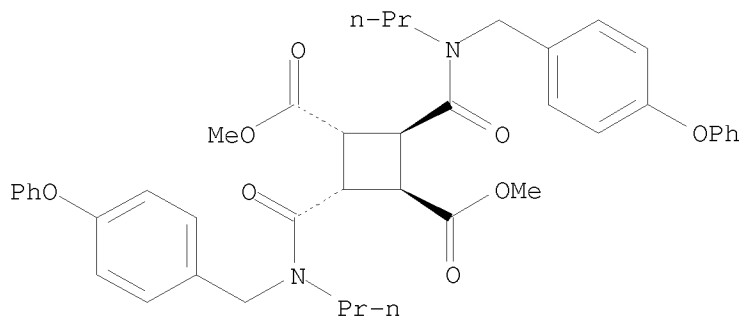
(Reactant or reagent)

(preparation of cyclobutanecarboxamide-derivative inhibitors of protein farnesyltransferase and squalene synthase)

RN 171349-59-0 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, dimethyl ester, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.



REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 8 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1997:48721 CAPLUS

DOCUMENT NUMBER: 126:59736

ORIGINAL REFERENCE NO.: 126:11729a,11732a

TITLE: Preparation of (4-phenoxybenzyl)aminocarbonyl-substituted cyclobutane derivatives as inhibitors of protein farnesyltransferase

INVENTOR(S): Arendsen, David L.; Rosenberg, Saul H.; Rockway, Todd W.; Stein, Herman H.; Fung, Anthony K. L.

PATENT ASSIGNEE(S): Abbott Laboratories, USA

SOURCE: PCT Int. Appl., 309 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

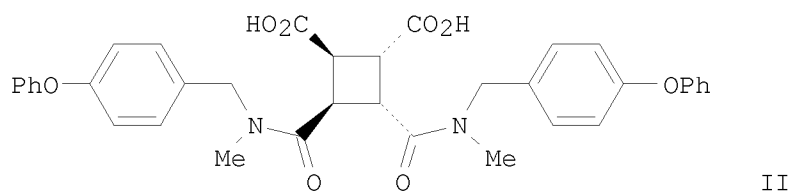
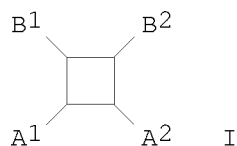
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9634850	A1	19961107	WO 1996-US6156	19960502
W: AU, CA, JP, KR, MX				
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
AU 9657227	A	19961121	AU 1996-57227	19960502
PRIORITY APPLN. INFO.:			US 1995-433718	A 19950503
			US 1995-564836	A 19951129
			US 1996-633205	A 19960426
			WO 1996-US6156	W 19960502

OTHER SOURCE(S): MARPAT 126:59736

GI



AB The title compds. [I; A1, A2 = XC(O)G, XC(S)G (wherein X = a bond, CH<sub>2</sub>, O, etc.; G = mono- or disubstituted NH<sub>2</sub>, substituted OH, SH); B1, B2 = CH<sub>2</sub>OH, CH<sub>2</sub>CH<sub>2</sub>OH, CHO, etc.], useful for inhibiting squalene synthetase and cholesterol biosynthesis, and treating hyperlipidemia, atherosclerosis and a fungal infection, were prepared Thus, reaction of 1,2,3,4-cyclobutanecarboxylic dianhydride with N-methyl-N-(4-phenoxybenzyl)amine in the presence of Et<sub>3</sub>N in DMF afforded 28% (1 $\alpha$ ,2 $\beta$ ,3 $\beta$ ,4 $\alpha$ )-II which showed 54% inhibition of squalene synthetase in vitro at 10  $\mu$ M.

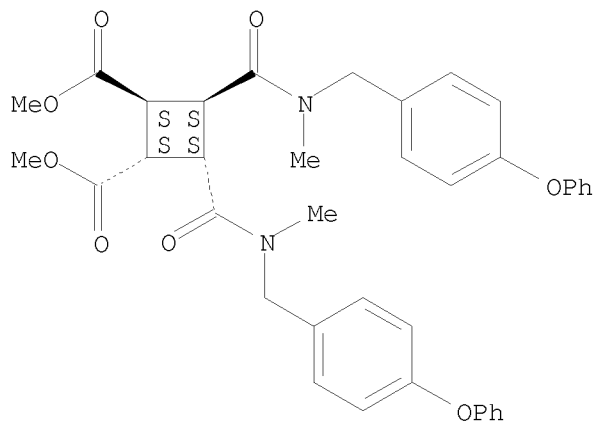
IT 169942-41-0P 169942-53-4P 169942-55-6P  
 169942-56-7P 169942-57-8P 169942-58-9P  
 169942-65-8P 169942-67-0P 169942-70-5P  
 185209-33-0P 185209-34-1P 185209-36-3P  
 185209-37-4P 185209-38-5P 185209-39-6P  
 185209-40-9P 185209-41-0P 185209-42-1P  
 185209-43-2P 185209-44-3P 185209-64-7P  
 185209-78-3P 185253-92-3P 185254-05-1P

RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)  
 (preparation of N-(4-phenoxybenzyl)aminocarbonyl-substituted cyclobutane derivs. as inhibitors of protein farnesyltransferase)

RN 169942-41-0 CAPLUS

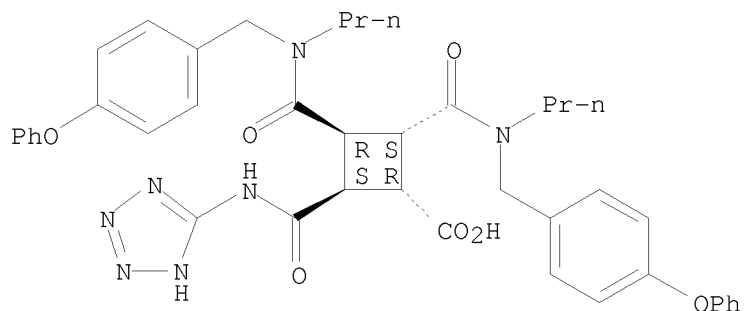
CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[methyl[(4-phenoxyphenyl)methyl]amino]carbonyl]-, dimethyl ester, (1R,2R,3R,4R)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



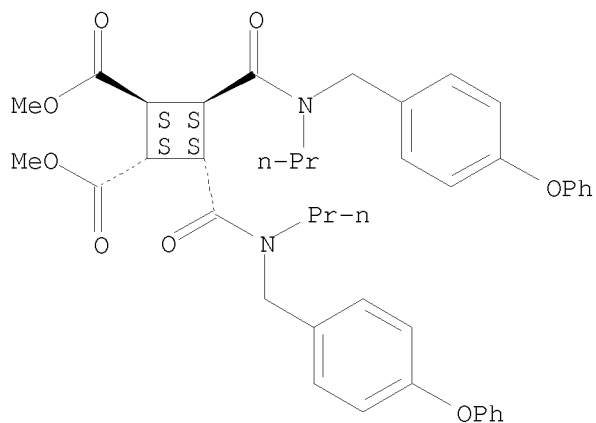
RN 169942-53-4 CAPLUS  
 CN Cyclobutanecarboxylic acid, 2,3-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-4-[(1H-tetrazol-5-ylamino)carbonyl]-, (1R,2S,3R,4S)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



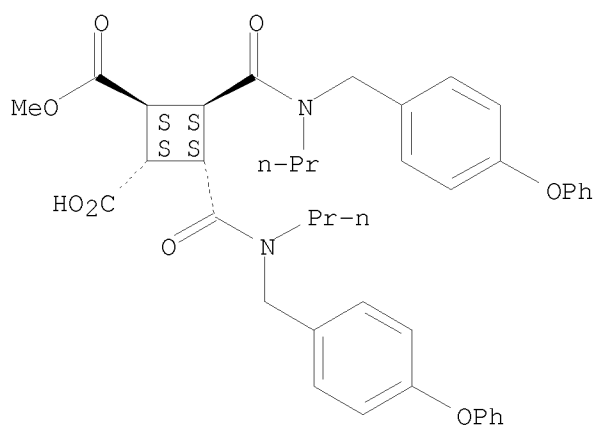
RN 169942-55-6 CAPLUS  
 CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, dimethyl ester, (1R,2R,3R,4R)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



RN 169942-56-7 CAPLUS  
 CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, monomethyl ester, (1R,2R,3R,4R)-rel- (9CI) (CA INDEX NAME)

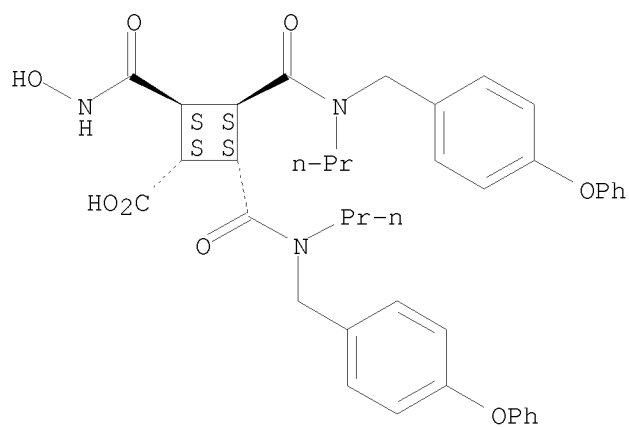
Relative stereochemistry.



RN 169942-57-8 CAPLUS

CN Cyclobutanecarboxylic acid, 2-[(hydroxyamino)carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

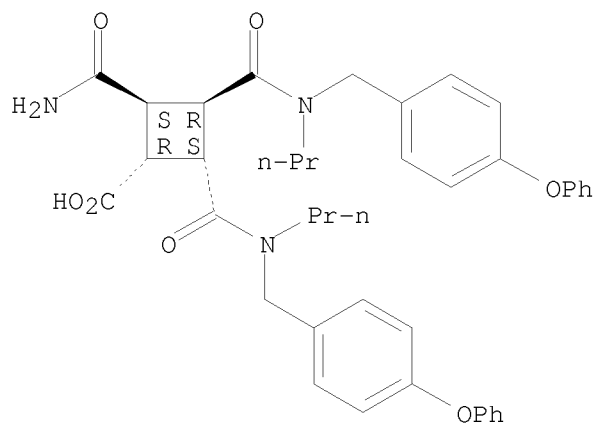
Relative stereochemistry.



RN 169942-58-9 CAPLUS

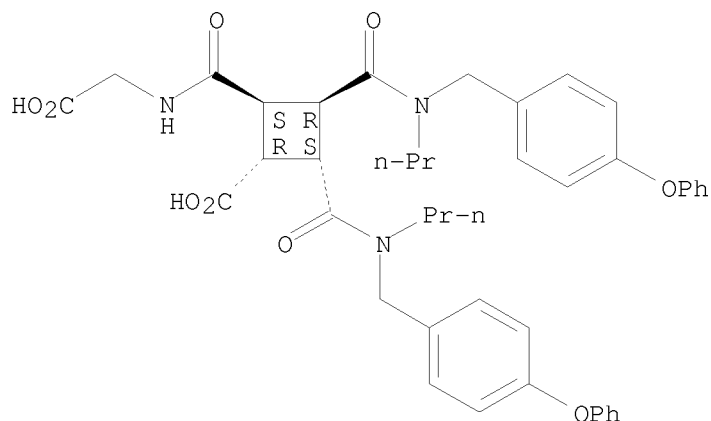
CN Cyclobutanecarboxylic acid, 2-(aminocarbonyl)-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1R,2S,3R,4S)-rel- (CA INDEX NAME)

Relative stereochemistry.



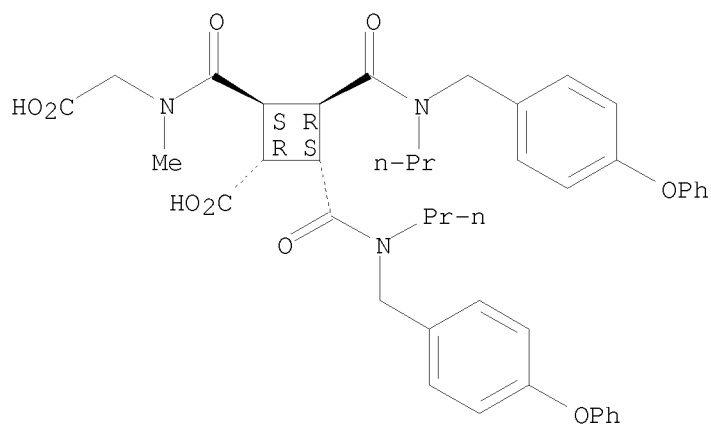
RN 169942-65-8 CAPLUS  
 CN Cyclobutanecarboxylic acid, 2-[[[(carboxymethyl)amino]carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1R,2S,3R,4S)-rel- (CA INDEX NAME)

Relative stereochemistry.



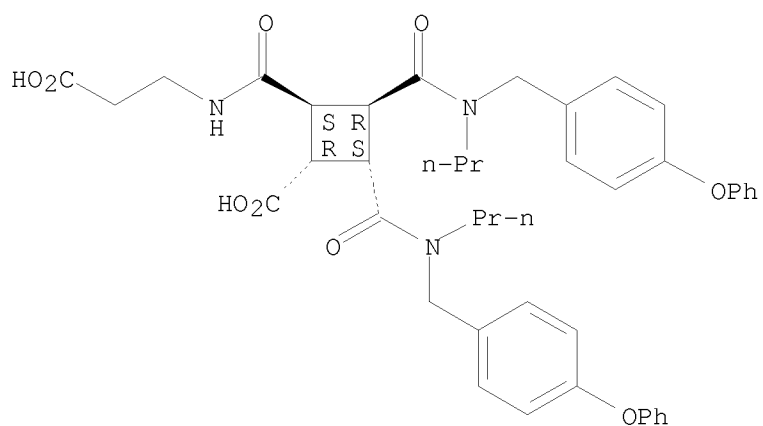
RN 169942-67-0 CAPLUS  
 CN Cyclobutanecarboxylic acid, 2-[[[(carboxymethyl)methylamino]carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1R,2S,3R,4S)-rel- (CA INDEX NAME)

Relative stereochemistry.



RN 169942-70-5 CAPLUS  
 CN Cyclobutanecarboxylic acid, 2-[[[(2-carboxyethyl)amino]carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1R,2S,3R,4S)-rel- (CA INDEX NAME)

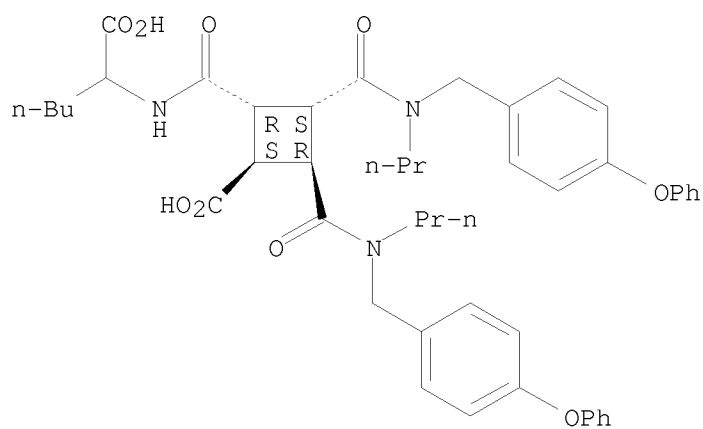
Relative stereochemistry.



RN 185209-33-0 CAPLUS

CN Cyclobutanecarboxylic acid, 2-[[[(1-carboxypentyl)amino]carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1R,2S,3R,4S)-rel- (CA INDEX NAME)

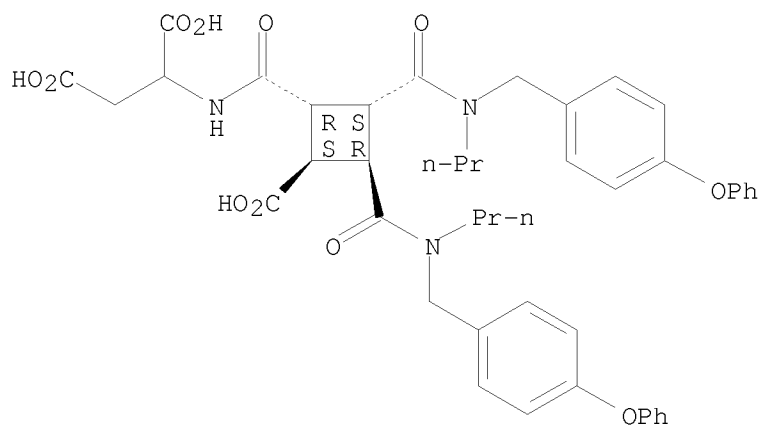
Relative stereochemistry.



RN 185209-34-1 CAPLUS

CN Aspartic acid, N-[[[(1R,2S,3R,4S)-2-carboxy-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]cyclobutyl]carbonyl]-, rel- (CA INDEX NAME)

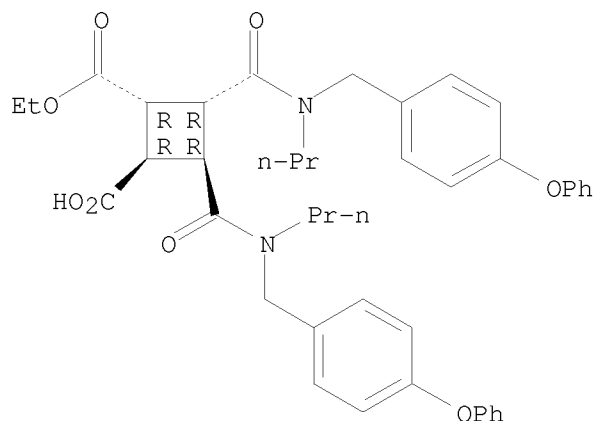
Relative stereochemistry.



RN 185209-36-3 CAPLUS

CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, 1-ethyl ester, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

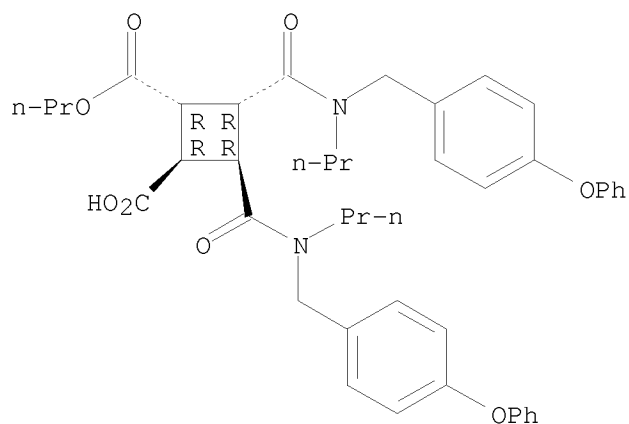
Relative stereochemistry.



RN 185209-37-4 CAPLUS

CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, 1-propyl ester, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

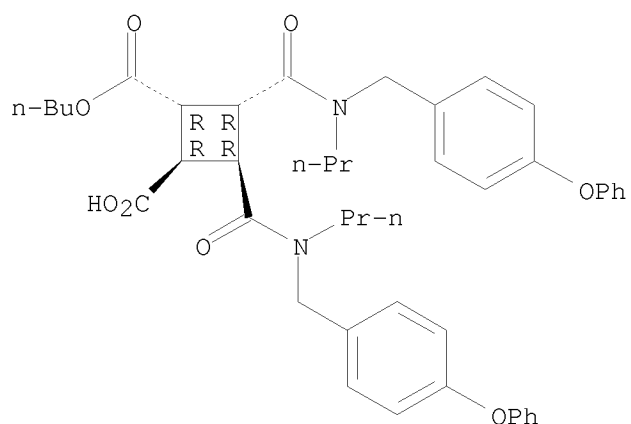
Relative stereochemistry.



RN 185209-38-5 CAPLUS

CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, 1-butyl ester, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

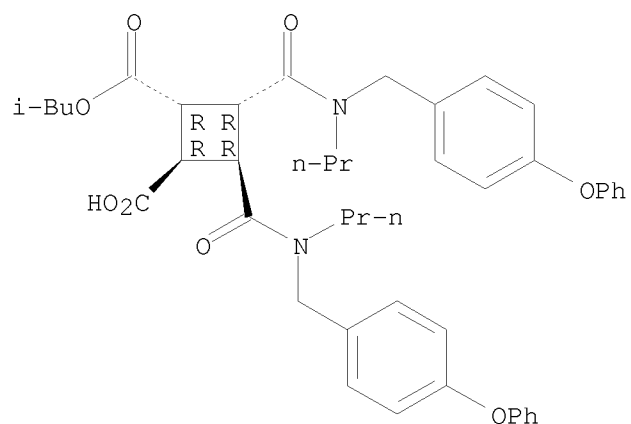
Relative stereochemistry.



RN 185209-39-6 CAPLUS

CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, mono(2-methylpropyl) ester, (1R,2R,3R,4R)-rel- (9CI) (CA INDEX NAME)

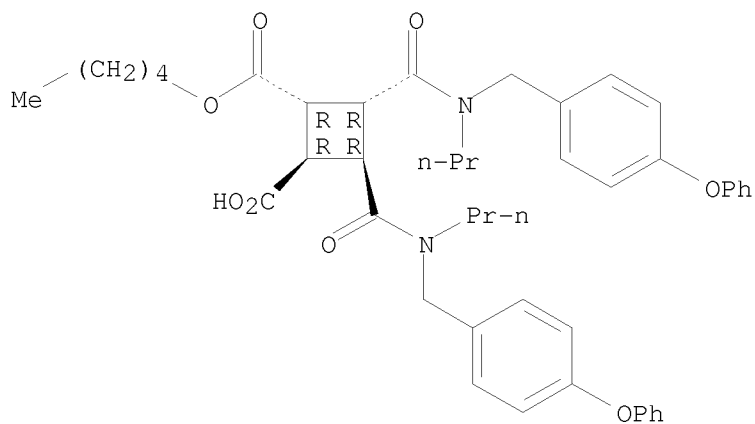
Relative stereochemistry.



RN 185209-40-9 CAPLUS

CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, 1-pentyl ester, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

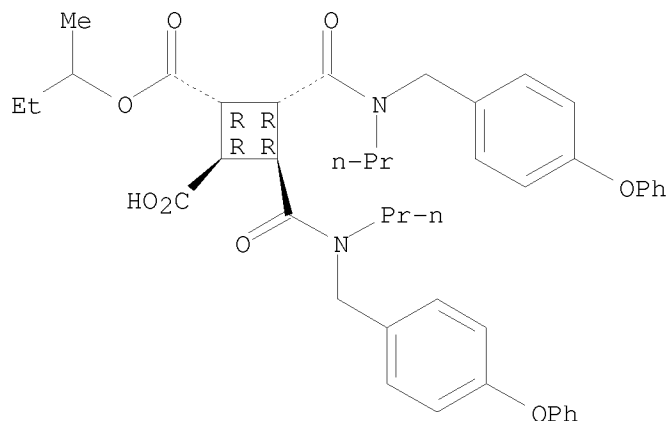
Relative stereochemistry.



RN 185209-41-0 CAPLUS

CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, 1-(1-methylpropyl) ester, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

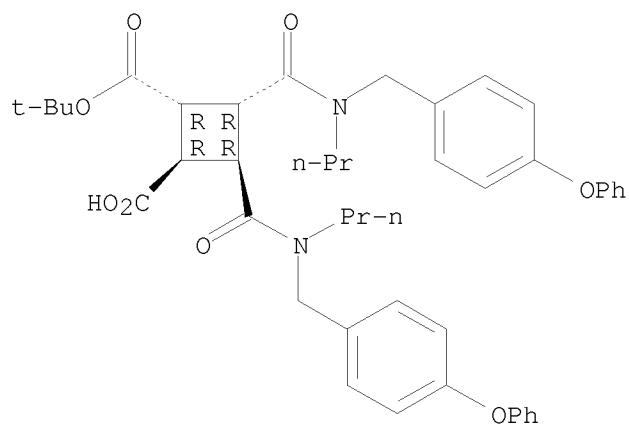
Relative stereochemistry.



RN 185209-42-1 CAPLUS

CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, 1-(1,1-dimethylethyl) ester, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

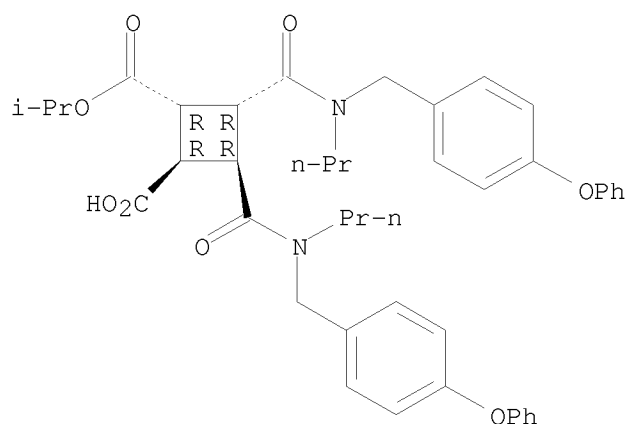
Relative stereochemistry.



RN 185209-43-2 CAPLUS

CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, 1-(1-methylethyl) ester, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

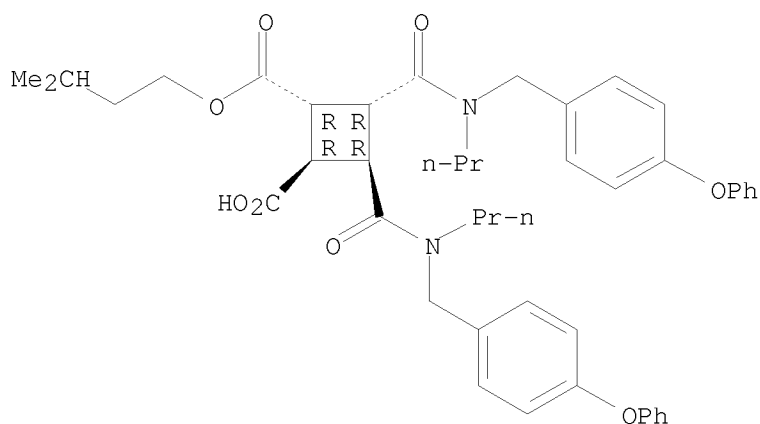
Relative stereochemistry.



RN 185209-44-3 CAPLUS

CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, mono(3-methylbutyl) ester, (1R,2R,3R,4R)-rel- (9CI) (CA INDEX NAME)

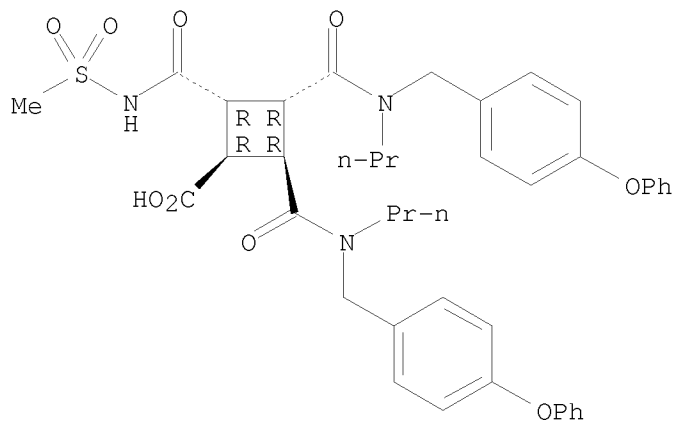
Relative stereochemistry.



RN 185209-64-7 CAPLUS

CN Cyclobutanecarboxylic acid, 2-[[[(methylsulfonyl)amino]carbonyl]-3,4-bis[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

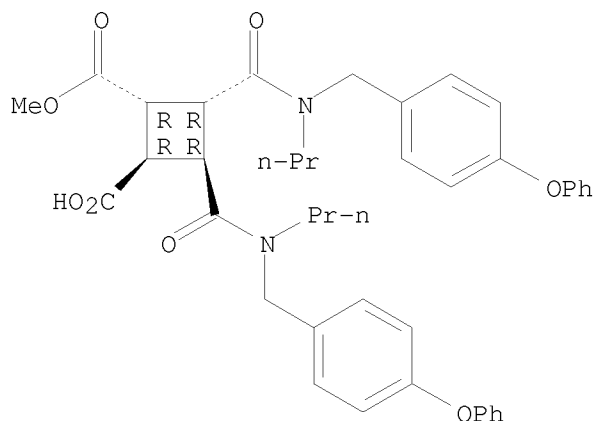
Relative stereochemistry.



RN 185209-78-3 CAPLUS

CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, 1-methyl ester, (1R,2R,3R,4R)-rel-(-)- (CA INDEX NAME)

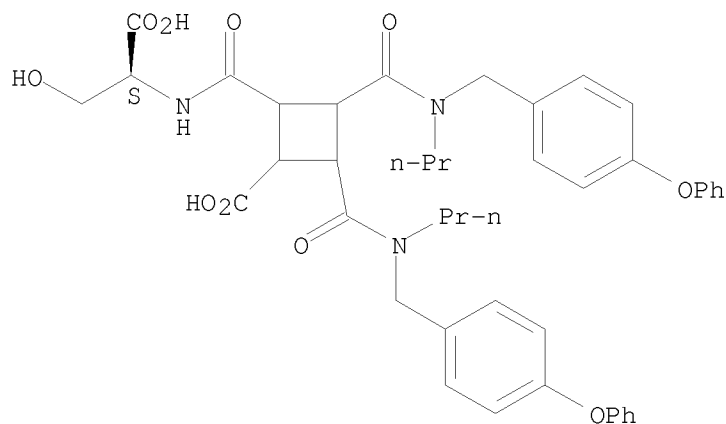
Rotation (-). Absolute stereochemistry unknown.



RN 185253-92-3 CAPLUS

CN Cyclobutanecarboxylic acid, 2-[[[(1S)-1-carboxy-2-hydroxyethyl]amino]carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]- (CA INDEX NAME)

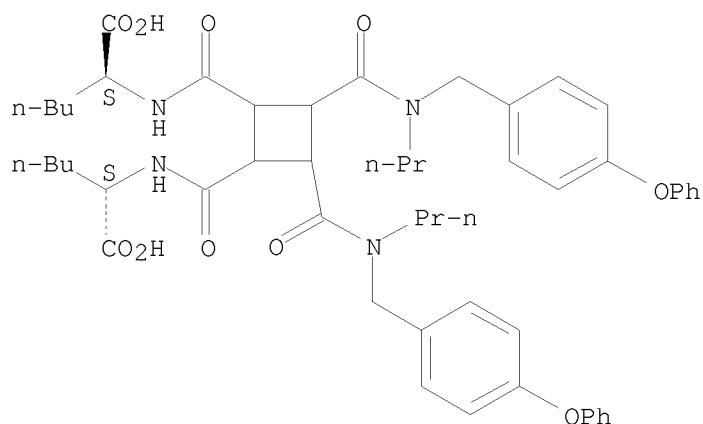
Absolute stereochemistry.



RN 185254-05-1 CAPLUS

CN L-Norleucine, N,N'-[[3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-1,2-cyclobutanediyl]dicarbonyl]bis- (9CI) (CA INDEX NAME)

Absolute stereochemistry.



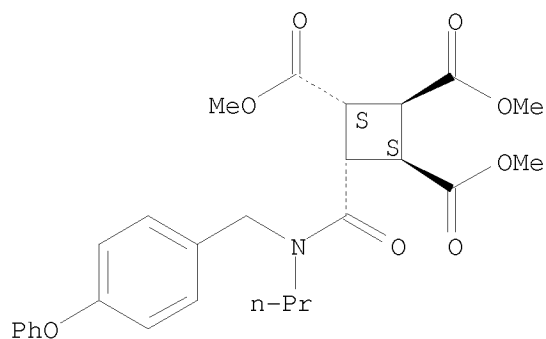
IT 169942-85-2P 169943-03-7P 169943-05-9P  
 169943-06-0P 169943-07-1P 169943-39-9P  
 170207-72-4P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (preparation of N-(4-phenoxybenzyl)aminocarbonyl-substituted cyclobutane  
 derivs. as inhibitors of protein farnesyltransferase)

RN 169942-85-2 CAPLUS

CN 1,2,3-Cyclobutanetricarboxylic acid,  
 4-[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, trimethyl ester,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

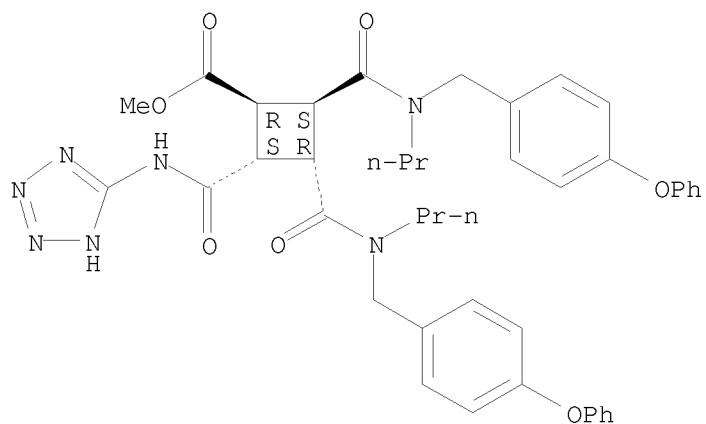
Relative stereochemistry.



RN 169943-03-7 CAPLUS

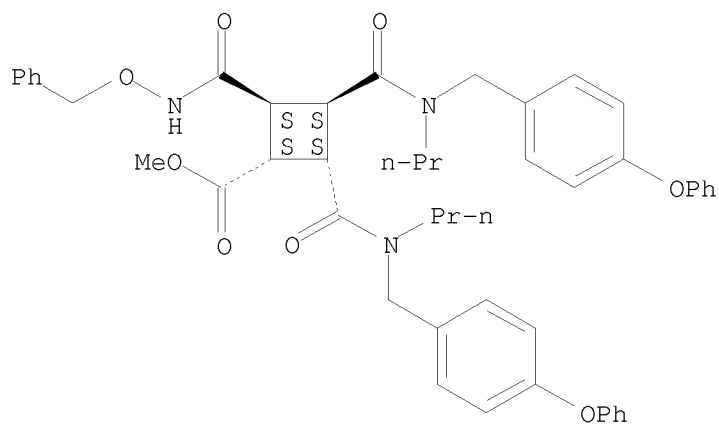
CN Cyclobutanecarboxylic acid, 2,3-bis[[[(4-  
 phenoxyphenyl)methyl]propylamino]carbonyl]-4-[(1H-tetrazol-5-  
 ylamino)carbonyl]-, methyl ester, (1R,2S,3R,4S)-rel- (9CI) (CA INDEX  
 NAME)

Relative stereochemistry.



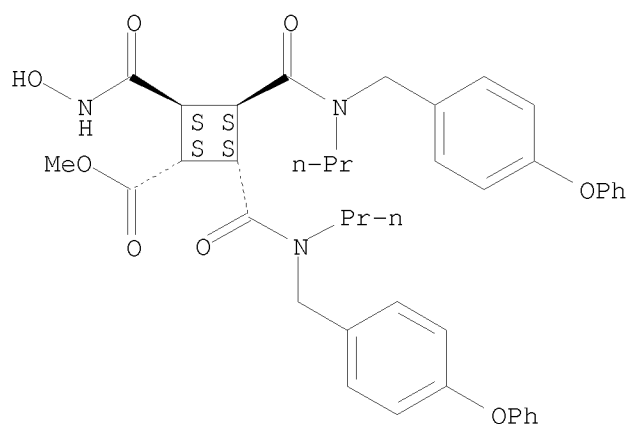
RN 169943-05-9 CAPLUS  
 CN Cyclobutanecarboxylic acid, 2,3-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-4-[[[(phenylmethoxy)amino]carbonyl]-, methyl ester, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

Relative stereochemistry.



RN 169943-06-0 CAPLUS  
 CN Cyclobutanecarboxylic acid, 2-[(hydroxyamino)carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, methyl ester, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

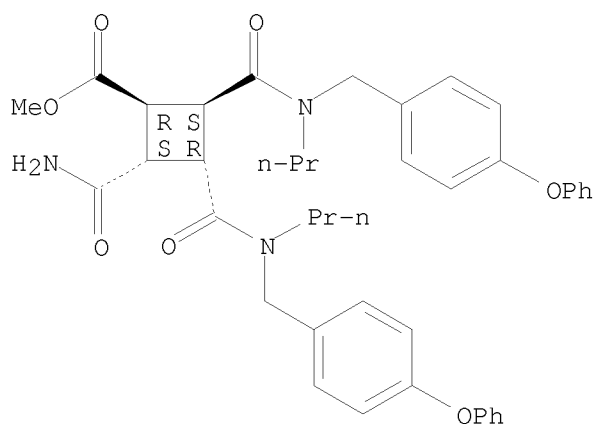
Relative stereochemistry.



RN 169943-07-1 CAPLUS

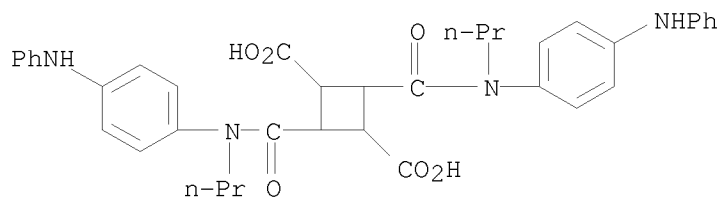
CN Cyclobutanecarboxylic acid, 2-(aminocarbonyl)-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, methyl ester, (1R,2S,3R,4S)-rel- (CA INDEX NAME)

Relative stereochemistry.



RN 169943-39-9 CAPLUS

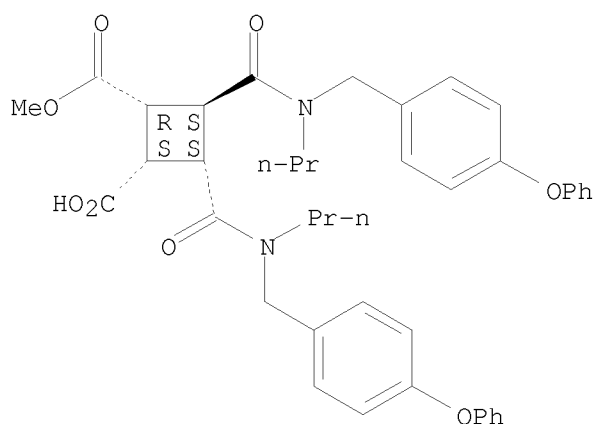
CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(phenylamino)phenyl]propylamino]carbonyl]- (CA INDEX NAME)



RN 170207-72-4 CAPLUS

CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, monomethyl ester, (1R,2S,3S,4S)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.

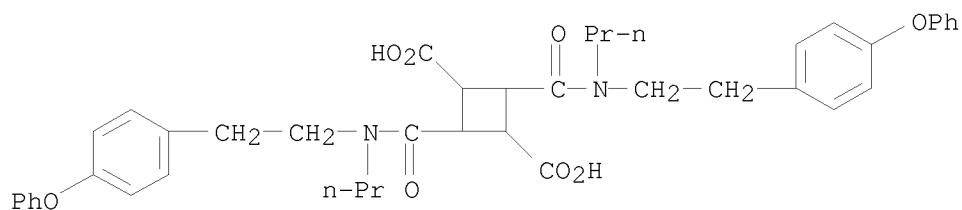


IT 169943-31-1P 169943-32-2P 185210-39-3P  
 185210-40-6P 185210-41-7P 185210-42-8P  
 185210-43-9P 185210-44-0P 185210-45-1P  
 185210-46-2P 185210-47-3P

RL: SPN (Synthetic preparation); PREP (Preparation)  
 (preparation of N-(4-phenoxybenzyl)aminocarbonyl-substituted cyclobutane  
 derivs. as inhibitors of protein farnesyltransferase)

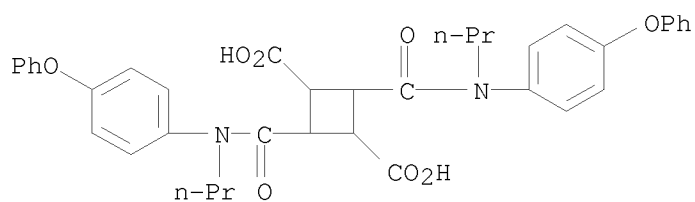
RN 169943-31-1 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-(4-  
 phenoxyphenyl)ethyl]propylamino]carbonyl]- (CA INDEX NAME)



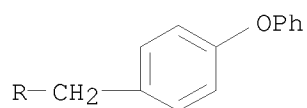
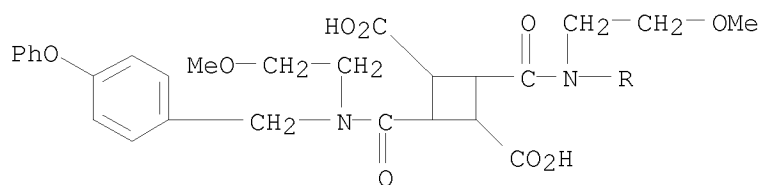
RN 169943-32-2 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-  
 phenoxyphenyl)propylamino]carbonyl]- (CA INDEX NAME)



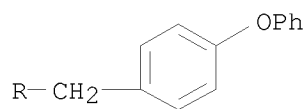
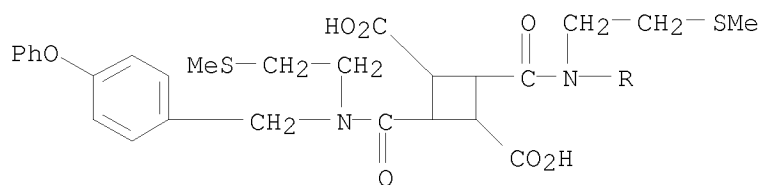
RN 185210-39-3 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-methoxyethyl)[(4-  
 phenoxyphenyl)methyl]amino]carbonyl]- (CA INDEX NAME)



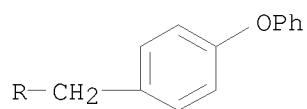
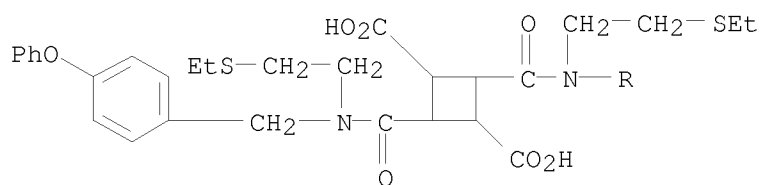
RN 185210-40-6 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[2-(methylthio)ethyl][(4-phenoxyphenyl)methyl]amino]carbonyl]- (CA INDEX NAME)



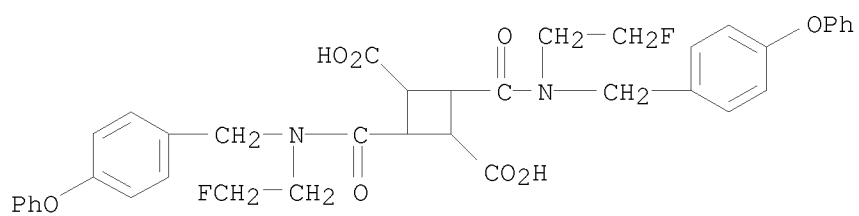
RN 185210-41-7 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[2-(ethylthio)ethyl][(4-phenoxyphenyl)methyl]amino]carbonyl]- (CA INDEX NAME)



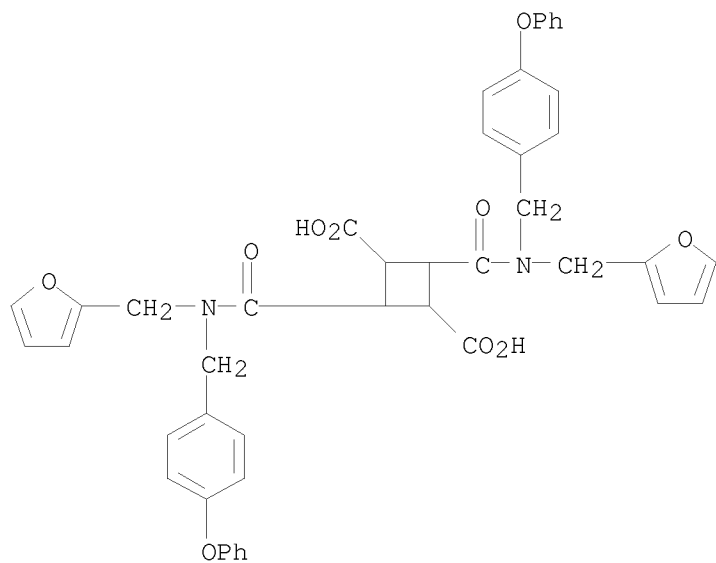
RN 185210-42-8 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[2-(fluoroethyl)ethyl][(4-phenoxyphenyl)methyl]amino]carbonyl]- (CA INDEX NAME)



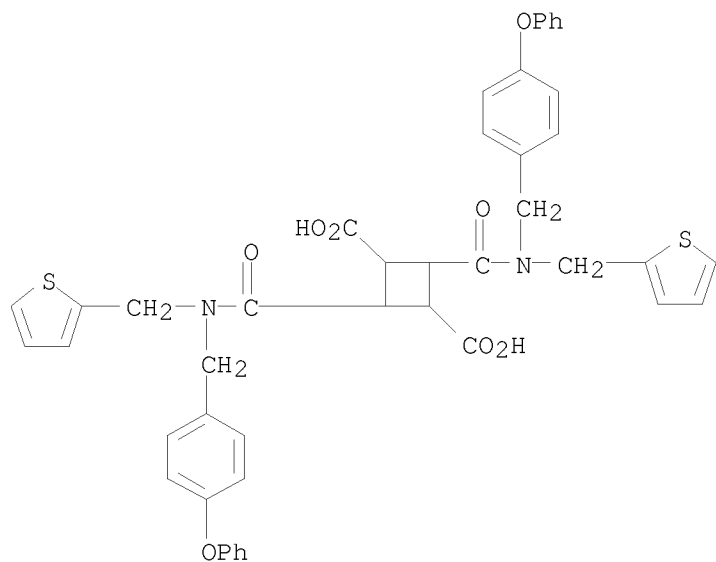
RN 185210-43-9 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-furanylmethyl)[(4-phenoxyphenyl)methyl]amino]carbonyl]- (CA INDEX NAME)

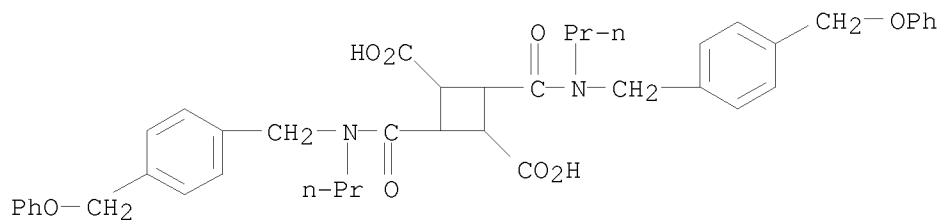


RN 185210-44-0 CAPLUS

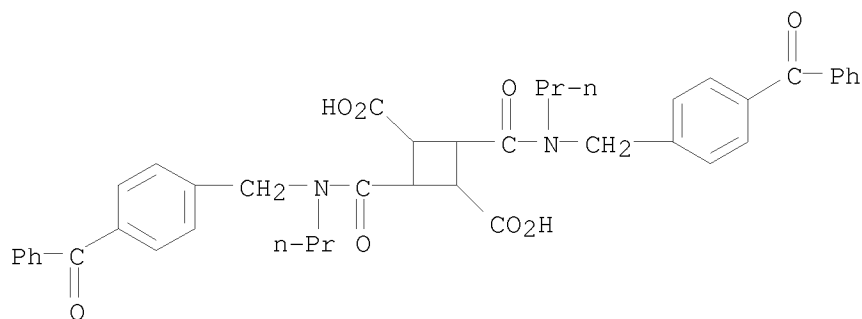
CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-thienylmethyl)[(4-phenoxyphenyl)methyl]amino]carbonyl]- (CA INDEX NAME)



RN 185210-45-1 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(phenoxy)methyl]phenyl]methyl]propylamino]carbonyl]- (CA INDEX NAME)

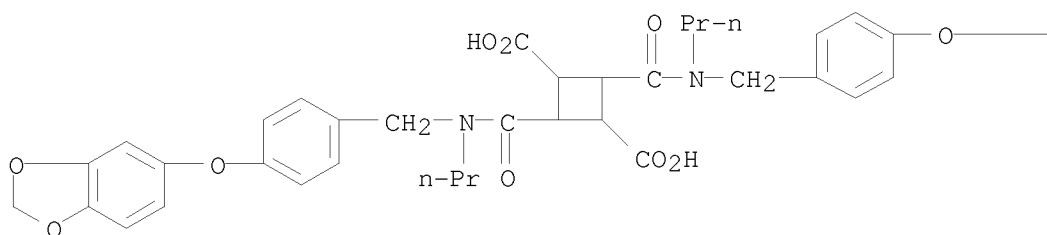


RN 185210-46-2 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-benzoylphenyl]methyl]propylamino]carbonyl]- (CA INDEX NAME)

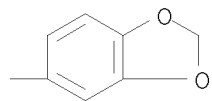


RN 185210-47-3 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(1,3-benzodioxol-5-yloxy)phenyl]methyl]propylamino]carbonyl]- (CA INDEX NAME)

PAGE 1-A



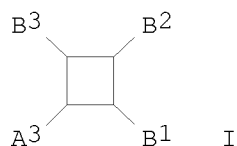
PAGE 1-B



REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ACCESSION NUMBER: 1997:41540 CAPLUS  
 DOCUMENT NUMBER: 126:59749  
 ORIGINAL REFERENCE NO.: 126:11733a,11736a  
 TITLE: Preparation of cyclobutane-derivative inhibitors of  
 squalene synthase and protein farnesyl transferase  
 INVENTOR(S): Arendsen, David L.; Baker, William R.; Fakhoury,  
 Stephen A.; Fung, K. L. Anthony; Garvey, David S.;  
 McClellan, William J.; O'Connor, Stephen J.; Prasad,  
 Rajnandan N.; Rockway, Todd W.; et al.  
 PATENT ASSIGNEE(S): Abbott Laboratories, USA  
 SOURCE: PCT Int. Appl., 133 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 2  
 PATENT INFORMATION:

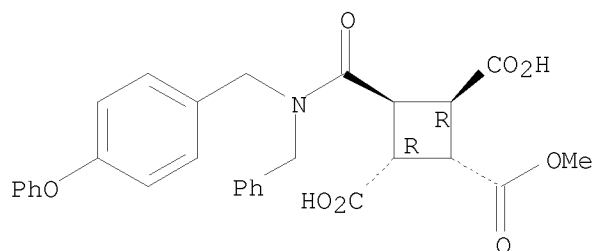
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9633159	A1	19961024	WO 1996-US5529	19960418
W: CA, JP, MX				
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
US 5831115	A	19981103	US 1996-626859	19960412
EP 821665	A1	19980204	EP 1996-912978	19960418
EP 821665	B1	20011004		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, PT, IE, FI				
JP 11504017	T	19990406	JP 1996-531980	19960418
AT 206390	T	20011015	AT 1996-912978	19960418
PRIORITY APPLN. INFO.:			US 1995-426553	A 19950421
			US 1995-428357	A 19950421
			US 1995-564524	A 19951129
			US 1996-626859	A 19960412
			WO 1996-US5529	W 19960418
OTHER SOURCE(S):	MARPAT 126:59749			
GI				



AB The title compds (I; permitted substituent values are defined in the disclosure), useful for inhibiting protein farnesyl transferase and the farnesylation of the oncogene protein Ras, or for inhibiting de-novo squalene production resulting in the inhibition of cholesterol biosynthesis, are prepared Thus, (1 $\alpha$ ,2 $\beta$ ,3 $\beta$ ,4 $\alpha$ )-1-[N-benzyl-N-[(4S,5S)-(4-hydroxy-5-methyl)-6-phenylhexyl]aminocarbonyl]cyclobutane-2,3,4-tricarboxylic acid, prepared from propionaldehyde in 10 steps, demonstrated a 92% inhibition of protein farnesyl transferase at 1 $\mu$ M.  
 IT 184228-21-5P 184228-25-9P 184228-39-5P  
 184488-03-7P  
 RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)  
 (preparation of cyclobutane-derivative inhibitors of squalene synthase and protein farnesyl transferase)  
 RN 184228-21-5 CAPLUS

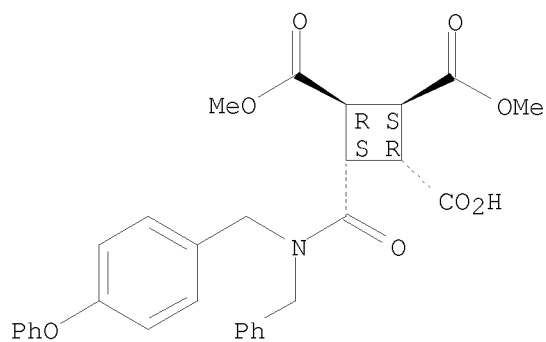
CN 1,2,3-Cyclobutanetricarboxylic acid,  
4-[[[(4-phenoxyphenyl)methyl](phenylmethyl)amino]carbonyl]-, 2-methyl  
ester, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )-(9CI) (CA INDEX NAME)

Relative stereochemistry.

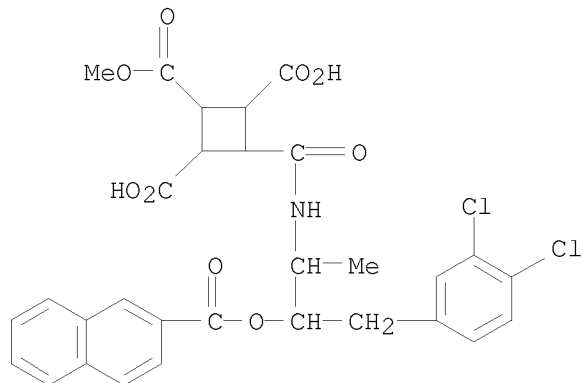


RN 184228-25-9 CAPLUS  
CN 1,2,3-Cyclobutanetricarboxylic acid,  
4-[[[(4-phenoxyphenyl)methyl](phenylmethyl)amino]carbonyl]-, 1,2-dimethyl  
ester, (1R,2S,3R,4S)-rel- (CA INDEX NAME)

Relative stereochemistry.

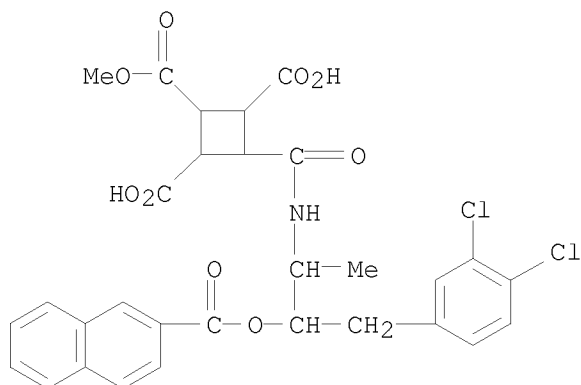


RN 184228-39-5 CAPLUS  
CN 1,2,3-Cyclobutanetricarboxylic acid,  
4-[[[(1S,2R)-3-(3,4-dichlorophenyl)-1-methyl-2-[(2-naphthalenylcarbonyl)oxy]propyl]amino]carbonyl]-, 2-methyl ester,  
stereoisomer (9CI) (CA INDEX NAME)



RN 184488-03-7 CAPLUS  
CN 1,2,3-Cyclobutanetricarboxylic acid,

4-[[[(1S,2R)-3-(3,4-dichlorophenyl)-1-methyl-2-[(2-naphthalenylcarbonyl)oxy]propyl]amino]carbonyl]-, 2-methyl ester, stereoisomer (9CI) (CA INDEX NAME)



REFERENCE COUNT: 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 10 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1995:978682 CAPLUS

DOCUMENT NUMBER: 124:29303

ORIGINAL REFERENCE NO.: 124:5623a,5626a

TITLE: Cyclobutane derivatives and their use as inhibitors of protein farnesyltransferase and squalene synthase  
 INVENTOR(S): Stein, Herman H.; Baker, William R.; Fung, Anthony K. L.; Rosenberg, Saul H.; Rockway, Todd W.; Fakhoury, Stephen A.; Garvey, David S.; Donner, B. Gregory; McClellan, William J.; et al.

PATENT ASSIGNEE(S): Abbott Laboratories, USA

SOURCE: PCT Int. Appl., 170 pp.

CODEN: PIXXD2

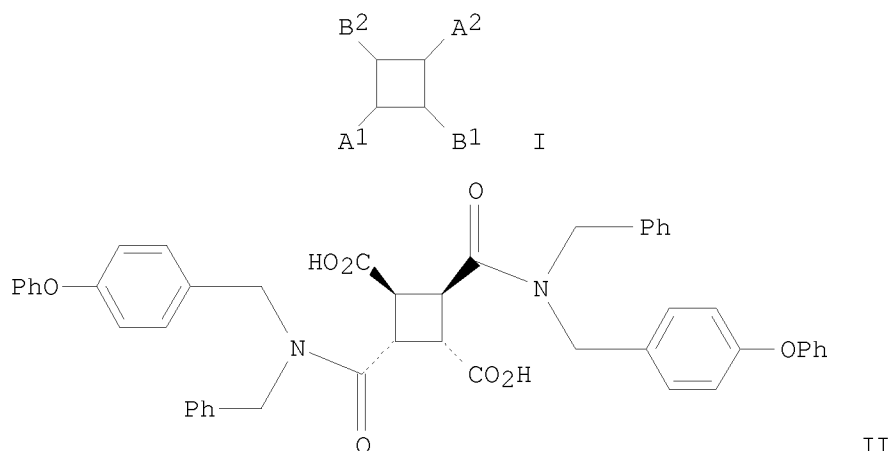
DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9521815	A1	19950817	WO 1995-US1360	19950201
W: CA, JP, MX				
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
PRIORITY APPLN. INFO.:			US 1994-194366	A 19940209
OTHER SOURCE(S):		MARPAT 124:29303		
GI				



AB The invention provides compds. I [A1, A2 = CONR1R2, (CH2)nNR1R2, NHCONR1R2, CO2R4; R1 = H, alkyl, aryl, aralkyl, etc.; R2 = aryl, aralkyl, alkenyl, etc.; R4 = aryl, aralkyl, etc.; B1, B2 = CH2OH, CH:NOH, WR5, CO2H and derivs., etc.; W = bond, alk(en)ylene, CONH, NHCONH; R5 = various (un)substituted heterocyclics, etc.] and their pharmaceutically acceptable salts. I inhibit protein farnesyltransferase and the farnesylation of the oncogene protein Ras, as well as de novo squalene production, resulting in the inhibition of cholesterol biosynthesis. For example, reaction of trans-1,2,3,4-cyclobutanetetracarboxylic acid dianhydride with 4-(PhO)C6H4CH2NHCH2Ph in THF gave, after chromatog. separation of isomers, title compound II in 32% yield. II gave 98% inhibition of rat brain protein farnesyltransferase in vitro at 10  $\mu$ M. Over 100 synthetic examples are given, plus data for inhibition of the title enzymes in vitro by selected compds.

IT 171483-72-0P 171483-73-1P 171483-74-2P  
171483-75-3P 171483-76-4P 171483-77-5P  
171483-78-6P 171483-79-7P

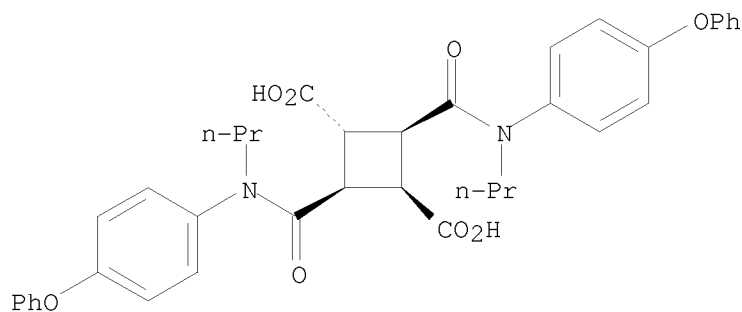
RL: BYP (Byproduct); PREP (Preparation)

(byproduct; preparation of cyclobutane derivs. as inhibitors of protein farnesyltransferase and squalene synthase)

RN 171483-72-0 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-phenoxyphenyl)propylamino]carbonyl]-, (1 $\alpha$ , 2 $\beta$ , 3 $\beta$ , 4 $\beta$ )- (CA INDEX NAME)

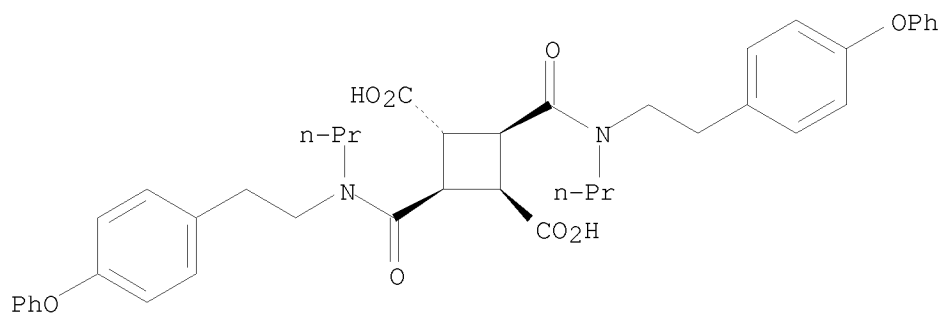
Relative stereochemistry.



RN 171483-73-1 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[2-(4-phenoxyphenyl)ethyl]propylamino]carbonyl]-, (1 $\alpha$ , 2 $\beta$ , 3 $\beta$ , 4 $\beta$ )- (CA INDEX NAME)

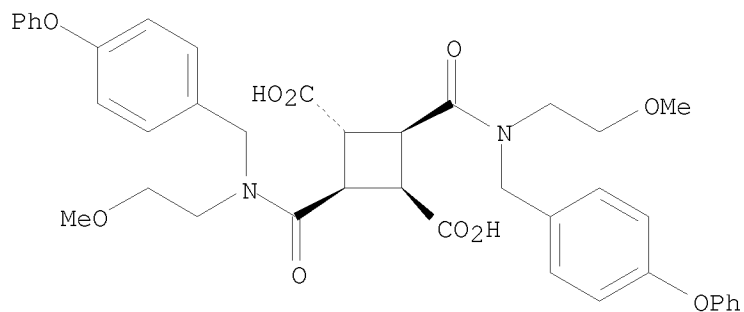
Relative stereochemistry.



RN 171483-74-2 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-methoxyethyl)((4-phenoxyphenyl)methyl)amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\alpha$ )- (CA INDEX NAME)

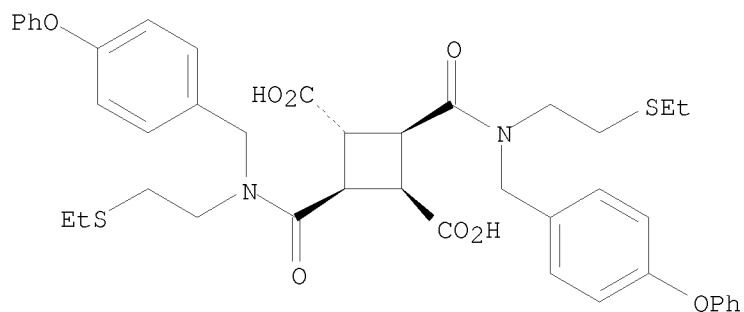
Relative stereochemistry.



RN 171483-75-3 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-ethylthioethyl)((4-phenoxyphenyl)methyl)amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\alpha$ )- (CA INDEX NAME)

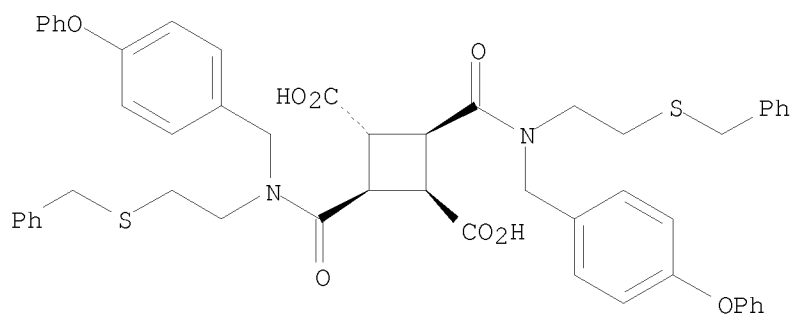
Relative stereochemistry.



RN 171483-76-4 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-ethylthioethyl)((4-phenoxyphenyl)methyl)amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\alpha$ )- (9CI) (CA INDEX NAME)

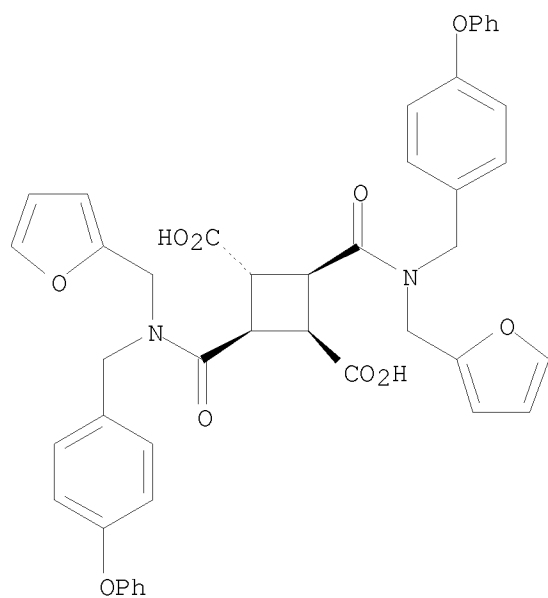
Relative stereochemistry.



RN 171483-77-5 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-furanylmethyl)[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\alpha$ )- (9CI) (CA INDEX NAME)

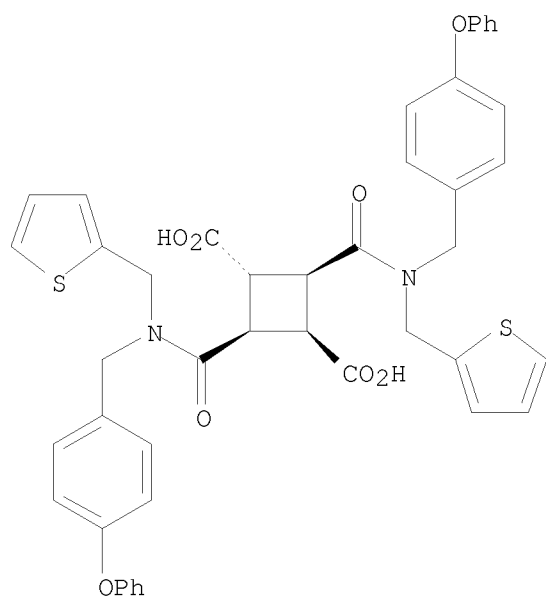
Relative stereochemistry.



RN 171483-78-6 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-phenoxyphenyl)methyl](2-thienylmethyl)amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\alpha$ )- (CA INDEX NAME)

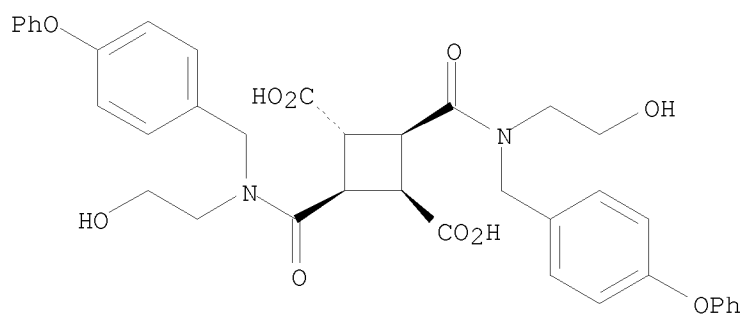
Relative stereochemistry.



RN 171483-79-7 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-hydroxyethyl)(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\alpha$ )- (CA INDEX NAME)

Relative stereochemistry.



IT 169942-85-2P 171349-59-0P

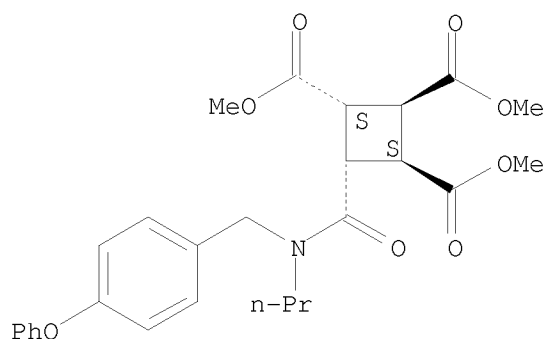
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(intermediate; preparation of cyclobutane derivs. as inhibitors of protein farnesyltransferase and squalene synthase)

RN 169942-85-2 CAPLUS

CN 1,2,3-Cyclobutanetricarboxylic acid, 4-[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, trimethyl ester, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

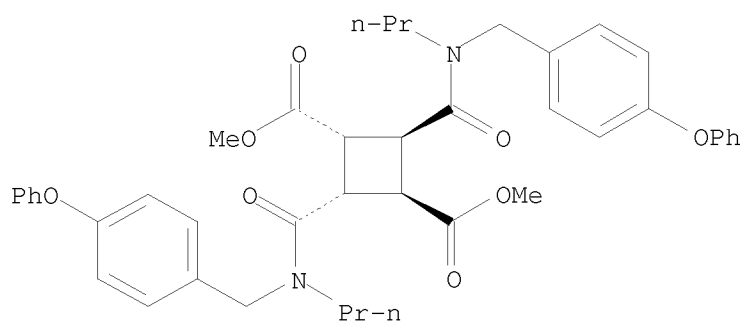
Relative stereochemistry.



RN 171349-59-0 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-phenoxyphenyl)methyl]propylamino]carbonyl-, dimethyl ester, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.



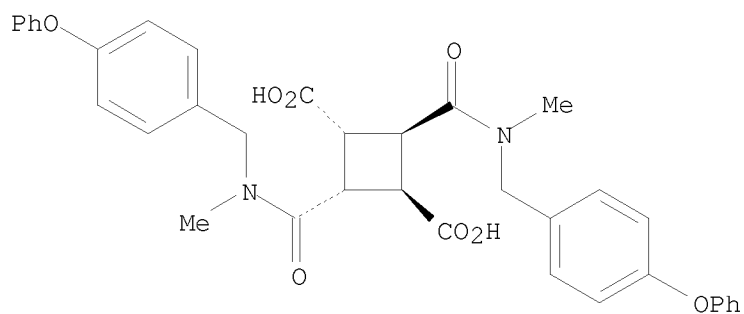
IT 171348-74-6P 171348-76-8P 171348-78-0P  
171349-05-6P

RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); RCT (Reactant); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)  
(preparation of cyclobutane derivs. as inhibitors of protein farnesyltransferase and squalene synthase)

RN 171348-74-6 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[methyl[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

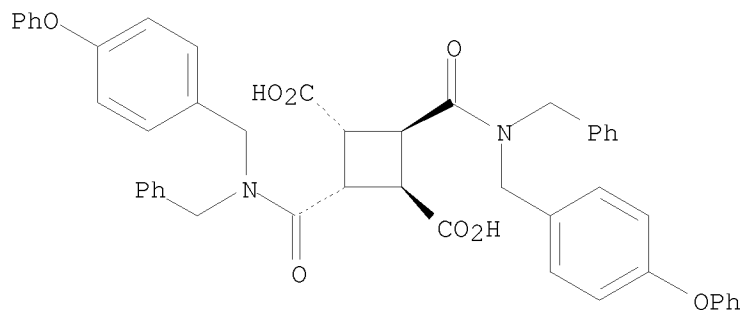
Relative stereochemistry.



RN 171348-76-8 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(4-phenoxyphenyl)methyl](phenylmethyl)amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

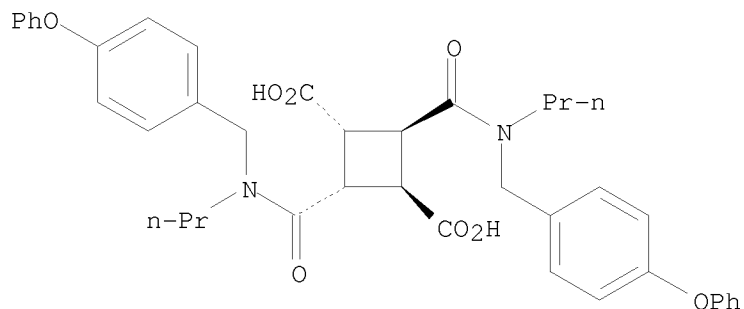
Relative stereochemistry.



RN 171348-78-0 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

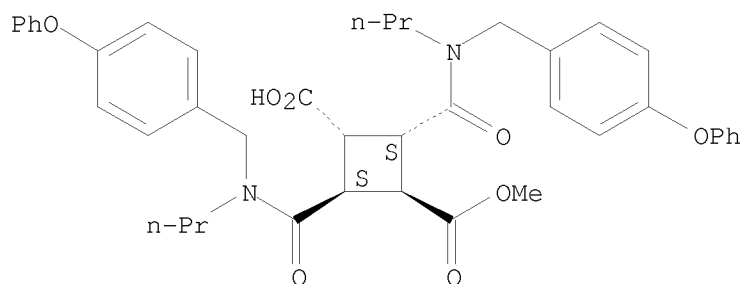
Relative stereochemistry.



RN 171349-05-6 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, monomethyl ester, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.



IT 171348-75-7P 171348-77-9P 171348-79-1P  
 171348-80-4P 171348-81-5P 171348-82-6P  
 171348-83-7P 171348-84-8P 171348-85-9P  
 171348-86-0P 171348-87-1P 171348-88-2P  
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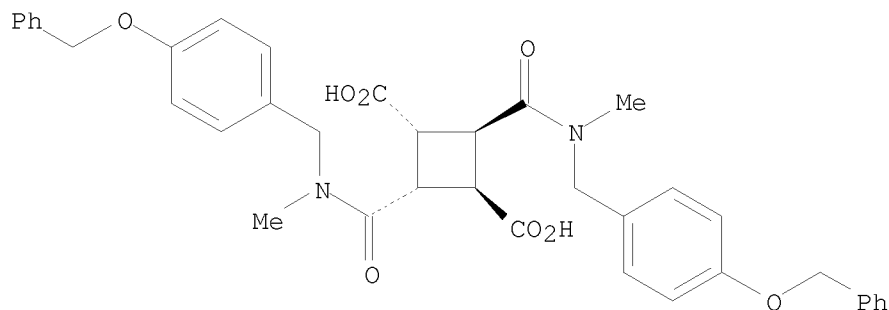
171348-92-8P 171348-93-9P 171348-94-0P  
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 171349-49-8P 171349-50-1P 171349-51-2P  
 171349-52-3P 171349-53-4P 171349-54-5P  
 171349-55-6P 171349-56-7P 171349-57-8P  
 171349-58-9P 171483-63-9P 171483-64-0P  
 171483-65-1P 171483-66-2P 171483-67-3P  
 171483-68-4P 171483-69-5P

RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)  
 (preparation of cyclobutane derivs. as inhibitors of protein farnesyltransferase and squalene synthase)

RN 171348-75-7 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[methyl[[4-(phenylmethoxy)phenyl]methyl]amino]carbonyl]-,  
 (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (CA INDEX NAME)

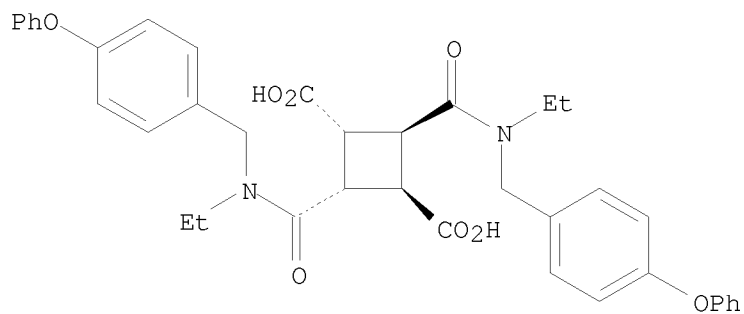
Relative stereochemistry.



RN 171348-77-9 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[ethyl[(4-phenoxyphenyl)methyl]amino]carbonyl]-,  
 (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (CA INDEX NAME)

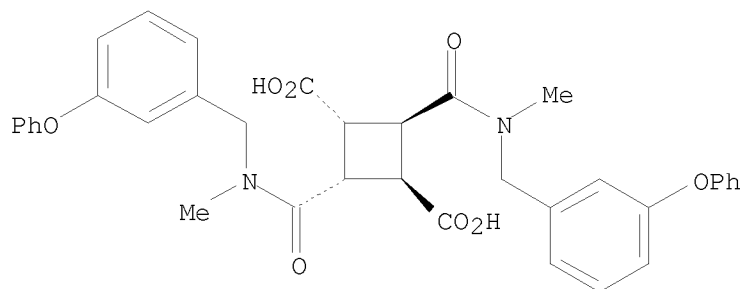
Relative stereochemistry.



RN 171348-79-1 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[methyl[(3-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

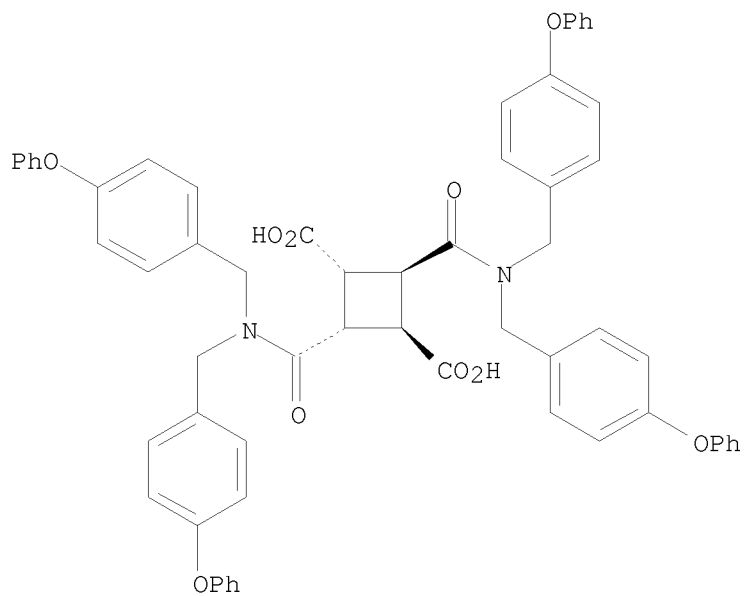
Relative stereochemistry.



RN 171348-80-4 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[bis[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.

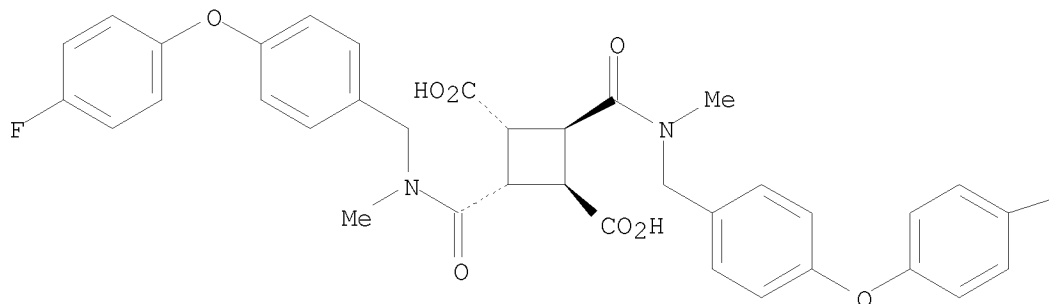


RN 171348-81-5 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(4-fluorophenoxy)phenyl]methyl]methylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.

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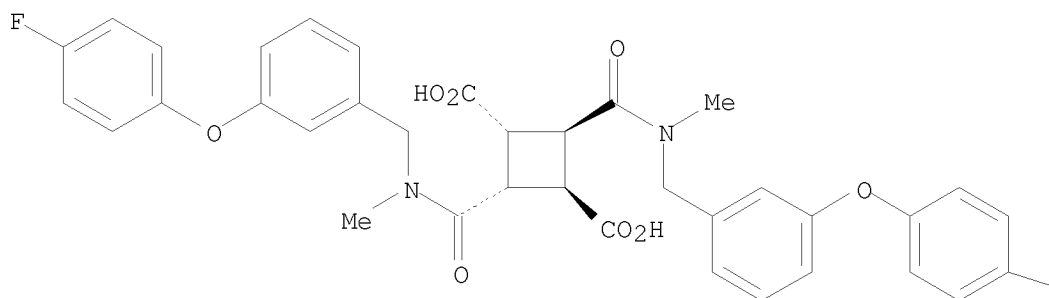
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RN 171348-82-6 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[3-(4-fluorophenoxy)phenyl]methyl]methylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.

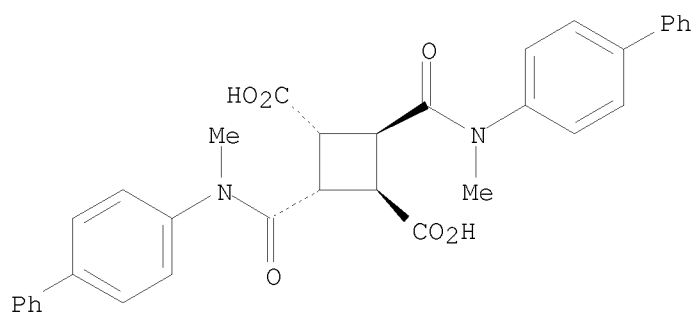
PAGE 1-A



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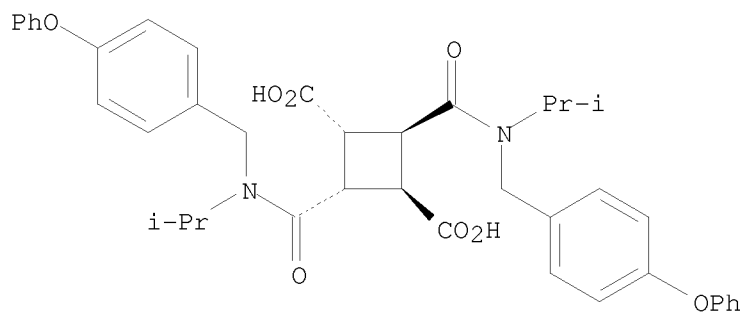
RN 171348-83-7 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[([1,1'-biphenyl]-4-ylmethylamino)carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.



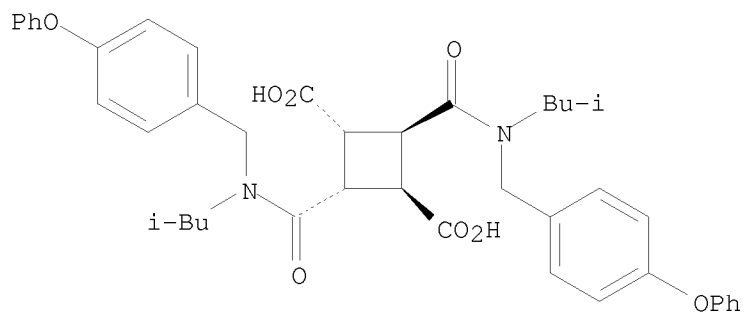
RN 171348-84-8 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[ (1-methylethyl) [(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.



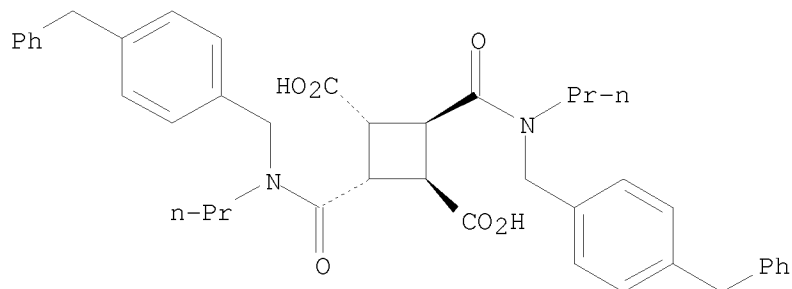
RN 171348-85-9 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[ (2-methylpropyl) [(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



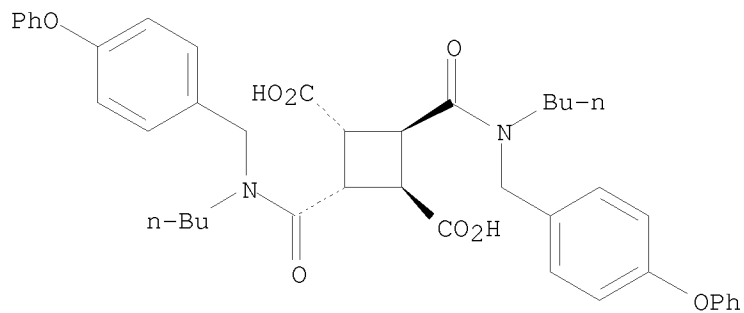
RN 171348-86-0 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(phenylmethyl)phenyl]methyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.



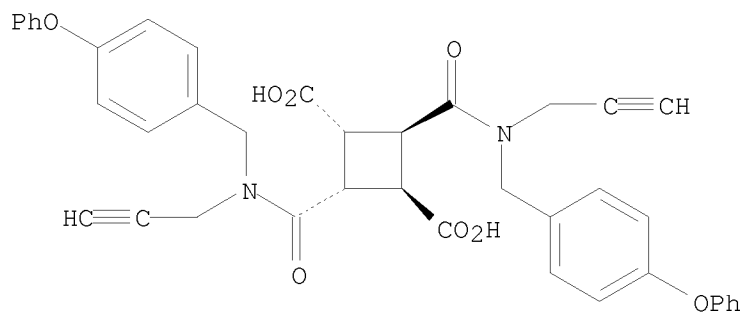
RN 171348-87-1 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[butyl[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



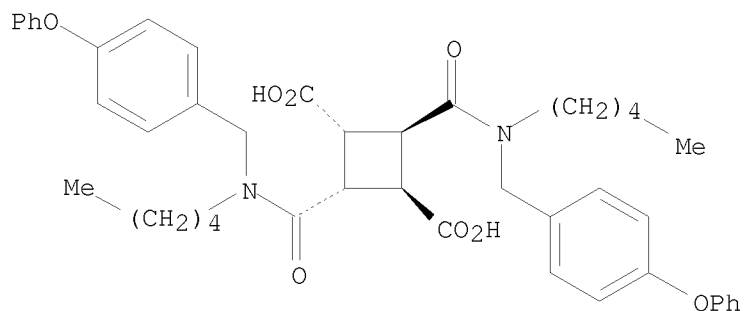
RN 171348-88-2 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(4-phenoxyphenyl)methyl]-2-propynylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.



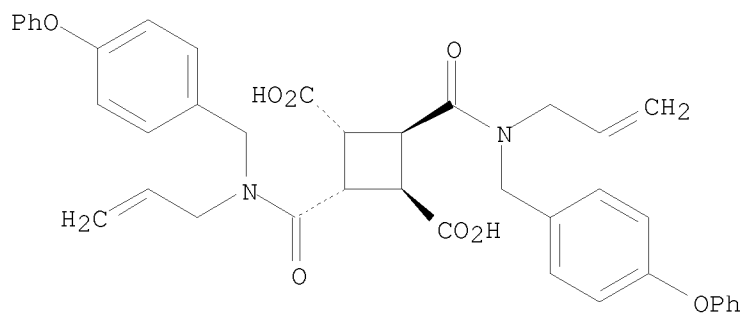
RN 171348-89-3 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[pentyl[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.



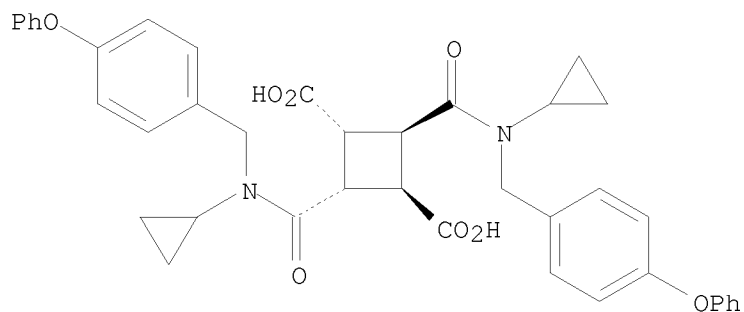
RN 171348-90-6 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(4-phenoxyphenyl)methyl]-2-propen-1-ylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



RN 171348-91-7 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[cyclopropyl[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

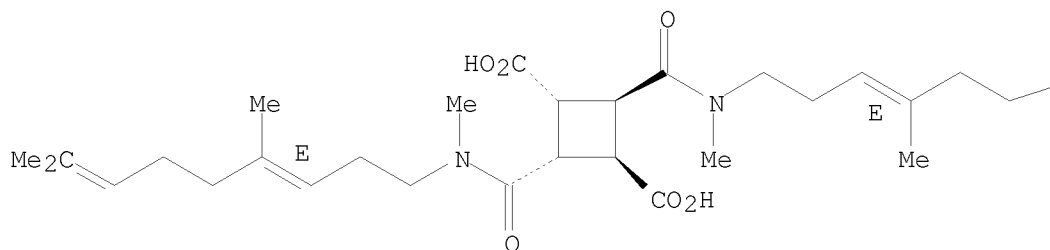
Relative stereochemistry.



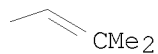
RN 171348-92-8 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4,8-dimethyl-3,7-nonadienyl)methylamino]carbonyl]-,  
 [1 $\alpha$ ,2 $\alpha$ (E),3 $\beta$ ,4 $\beta$ (E)]- (9CI) (CA INDEX NAME)

Relative stereochemistry.  
 Double bond geometry as shown.

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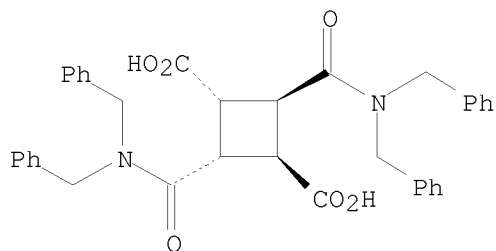


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RN 171348-93-9 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[bis(phenylmethyl)amino]carbonyl]-,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

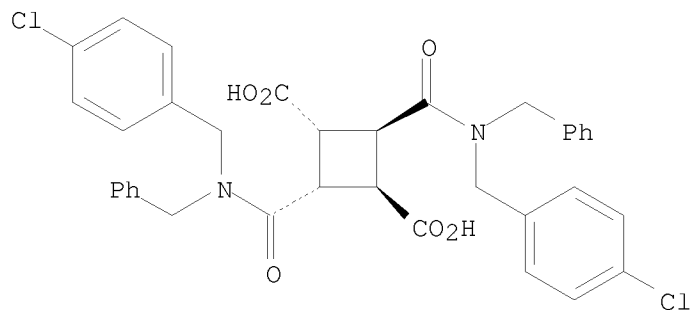
Relative stereochemistry.



RN 171348-94-0 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(4-chlorophenyl)methyl](phenylmethyl)amino]carbonyl]-,

(1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (CA INDEX NAME)

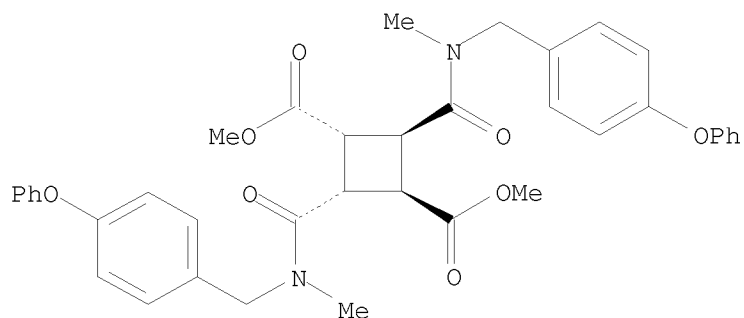
Relative stereochemistry.



RN 171348-95-1 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[methyl[(4-phenoxyphenyl)methyl]amino]carbonyl]-, dimethyl ester, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (9CI) (CA INDEX NAME)

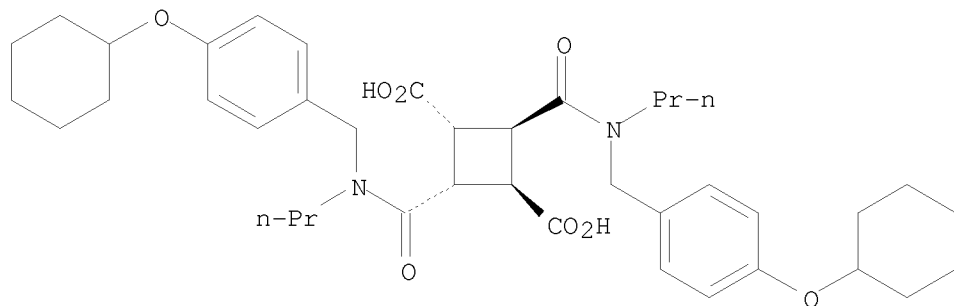
Relative stereochemistry.



RN 171348-97-3 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(cyclohexyloxy)phenyl]methyl]propylamino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (CA INDEX NAME)

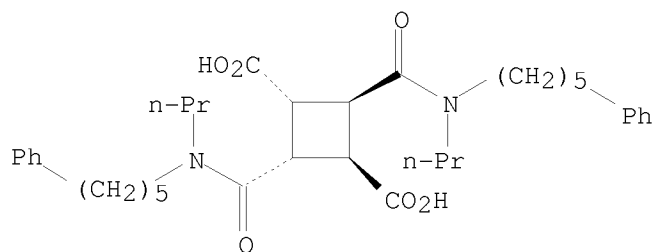
Relative stereochemistry.



RN 171348-98-4 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[5-phenylpentyl]propylamino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (9CI) (CA INDEX NAME)

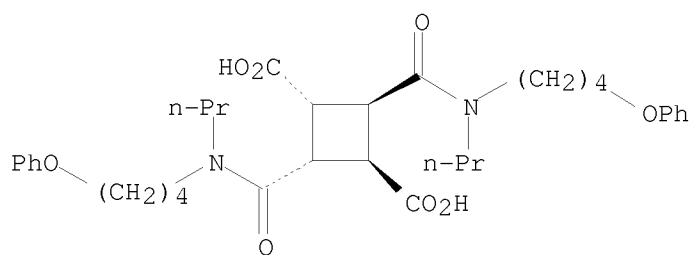
Relative stereochemistry.



RN 171348-99-5 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-phenoxybutyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )-(CA INDEX NAME)

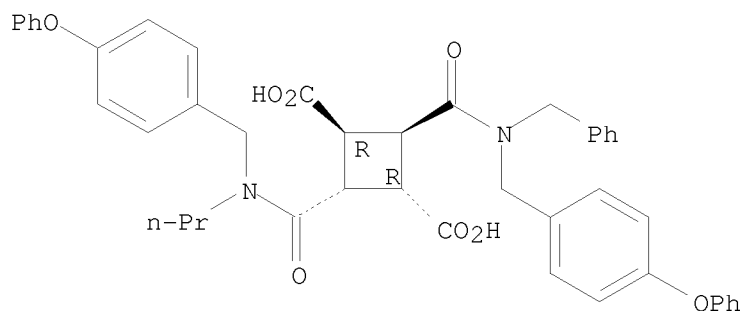
Relative stereochemistry.



RN 171349-00-1 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2-[[[(4-phenoxyphenyl)methyl](phenylmethyl)amino]carbonyl]-4-[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )-(9CI) (CA INDEX NAME)

Relative stereochemistry.

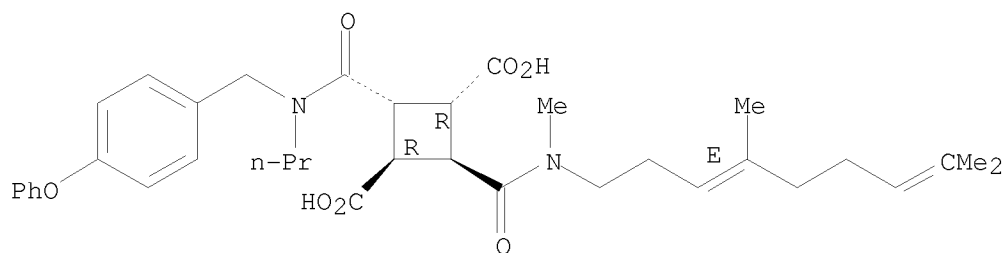


RN 171349-01-2 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2-[[[(4,8-dimethyl-3,7-nonadienyl)methylamino]carbonyl]-4-[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, stereoisomer (9CI) (CA INDEX NAME)

Relative stereochemistry.

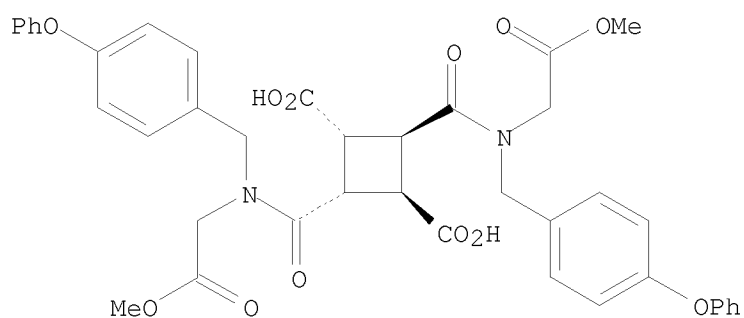
Double bond geometry as shown.



RN 171349-02-3 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[ (2-methoxy-2-oxoethyl) [(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (CA INDEX NAME)

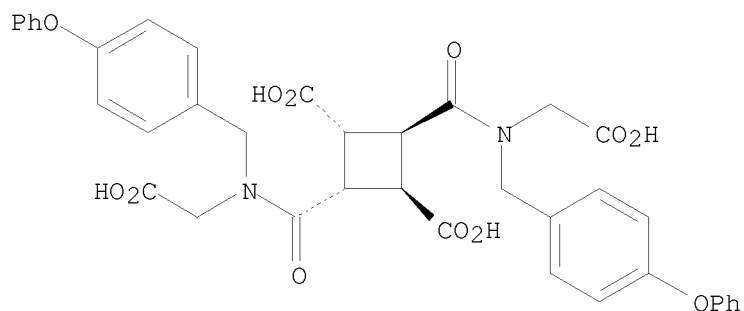
Relative stereochemistry.



RN 171349-03-4 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[ (carboxymethyl) [(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (CA INDEX NAME)

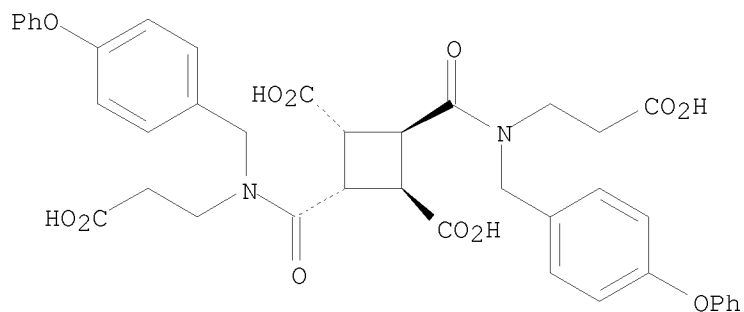
Relative stereochemistry.



RN 171349-04-5 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[ (2-carboxyethyl) [(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (CA INDEX NAME)

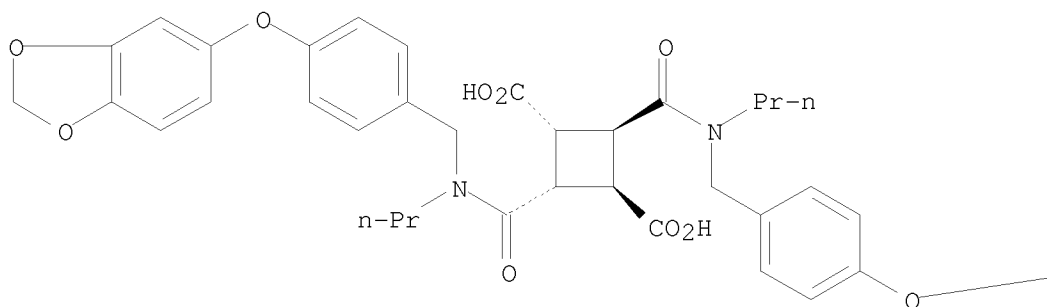
Relative stereochemistry.



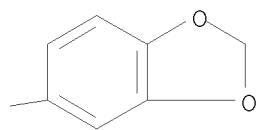
RN 171349-06-7 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(1,3-benzodioxol-5-yloxy)phenyl]methyl]propylamino]carbonyl]-,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.

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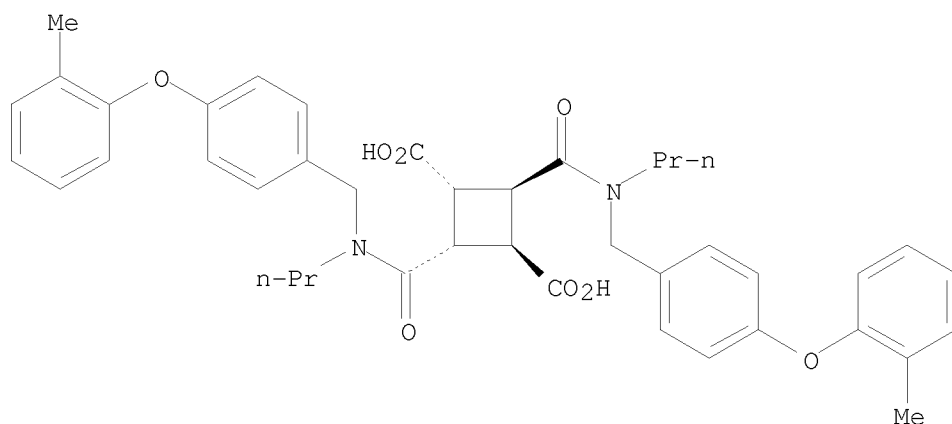


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RN 171349-09-0 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(2-methylphenoxy)phenyl]methyl]propylamino]carbonyl]-,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

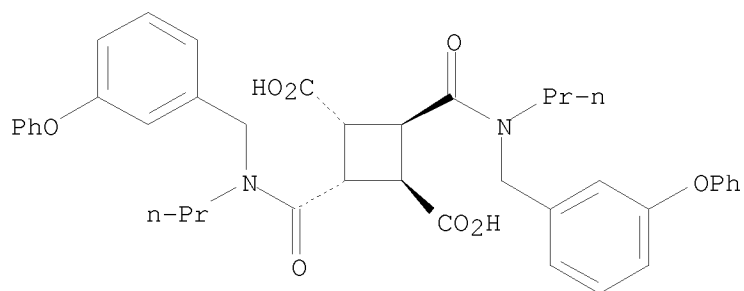
Relative stereochemistry.



RN 171349-10-3 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(3-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

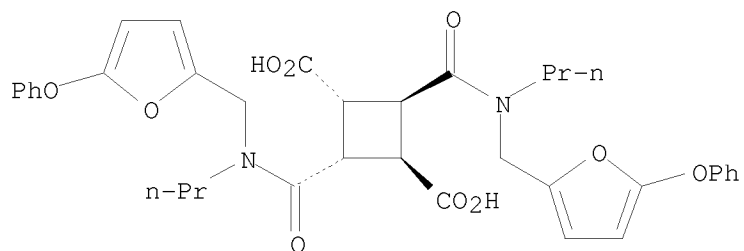
Relative stereochemistry.



RN 171349-11-4 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(5-phenoxy-2-furanyl)methyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

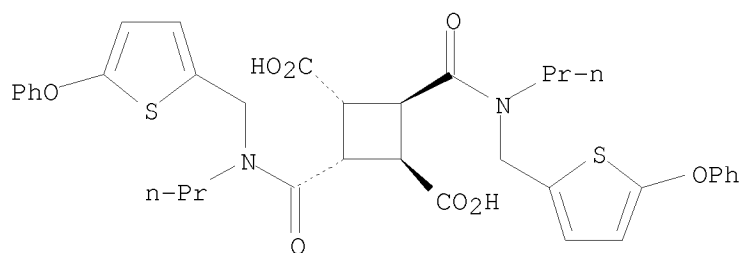
Relative stereochemistry.



RN 171349-12-5 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(5-phenoxy-2-thienyl)methyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

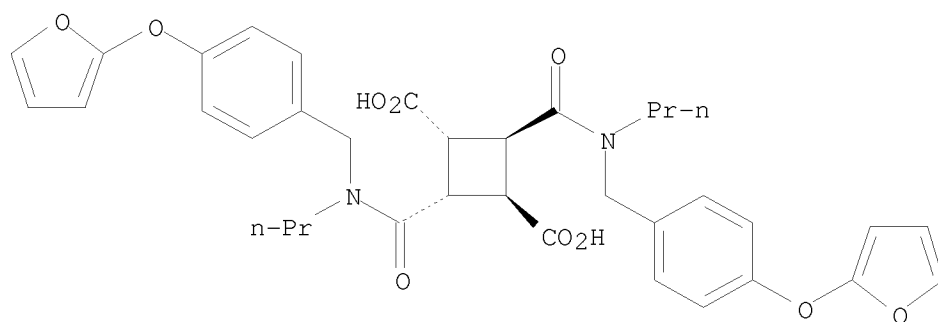
Relative stereochemistry.



RN 171349-13-6 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(2-furanyloxy)phenyl]methyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

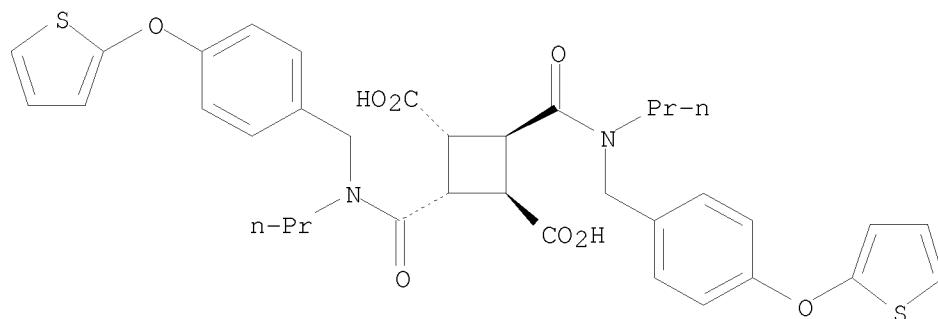
Relative stereochemistry.



RN 171349-14-7 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[propyl[[4-(2-thienyloxy)phenyl]methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

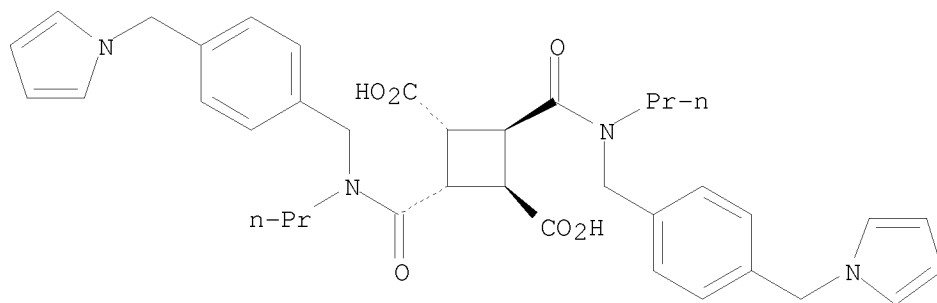
Relative stereochemistry.



RN 171349-15-8 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[propyl[[4-(1H-pyrrol-1-ylmethyl)phenyl]methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

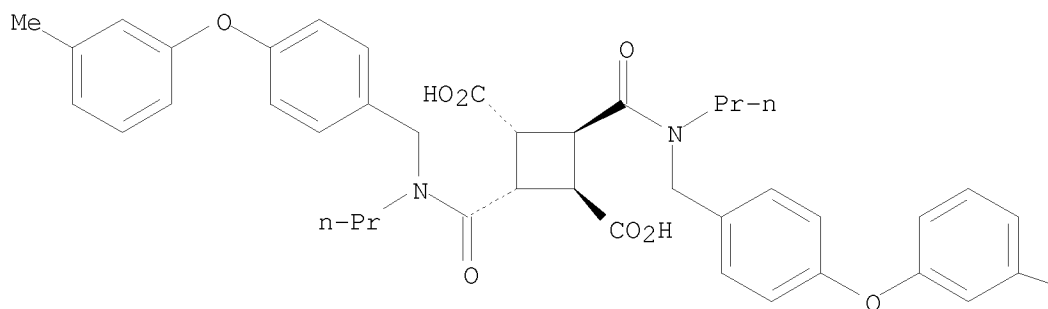
Relative stereochemistry.



RN 171349-16-9 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(3-methylphenoxy)phenyl]methyl]propylamino]carbonyl]-,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.

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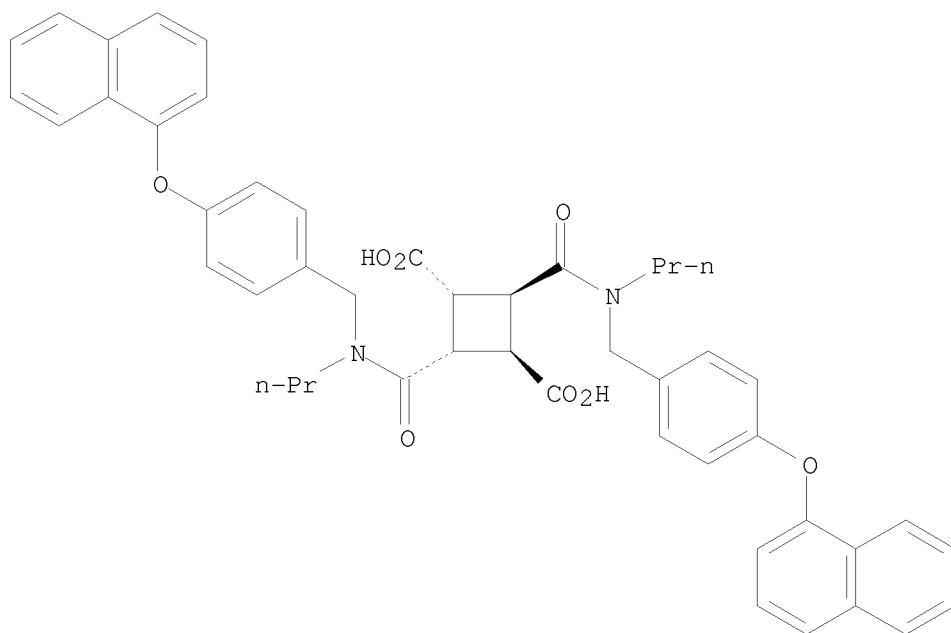


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Me

RN 171349-17-0 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(1-methylnaphthalenyloxy)phenyl]methyl]propylamino]carbonyl]-,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

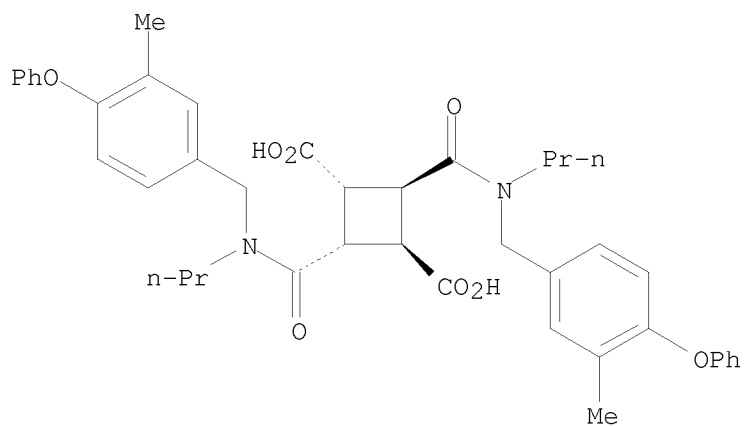
Relative stereochemistry.



RN 171349-18-1 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(3-methyl-4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

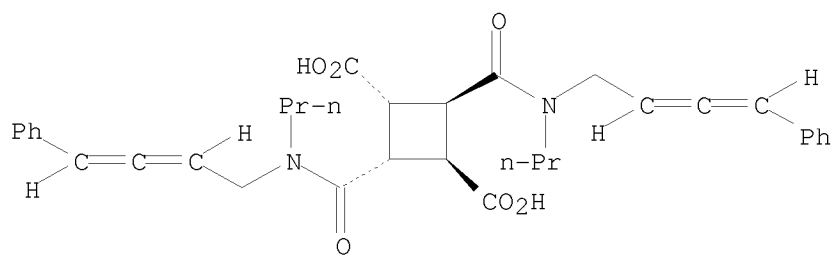
Relative stereochemistry.



RN 171349-19-2 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-phenyl-2,3-butadien-1-yl)propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

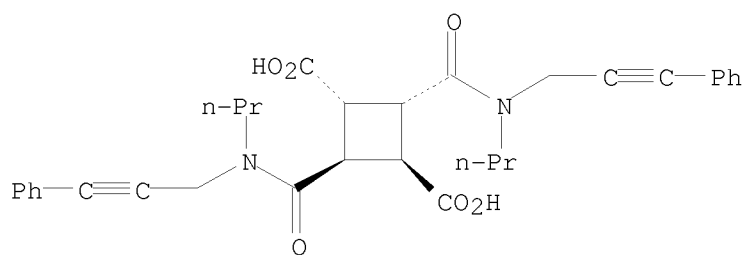
Relative stereochemistry.



RN 171349-20-5 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(3-phenyl-2-propynyl)propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )-(9CI) (CA INDEX NAME)

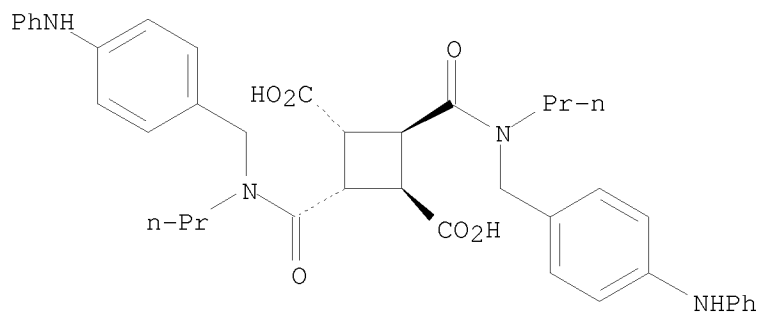
Relative stereochemistry.



RN 171349-21-6 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(phenylamino)phenyl)methyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )-(9CI) (CA INDEX NAME)

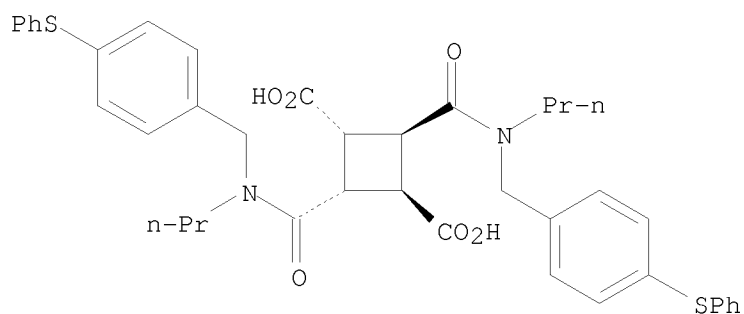
Relative stereochemistry.



RN 171349-22-7 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(phenylthio)phenyl)methyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )-(9CI) (CA INDEX NAME)

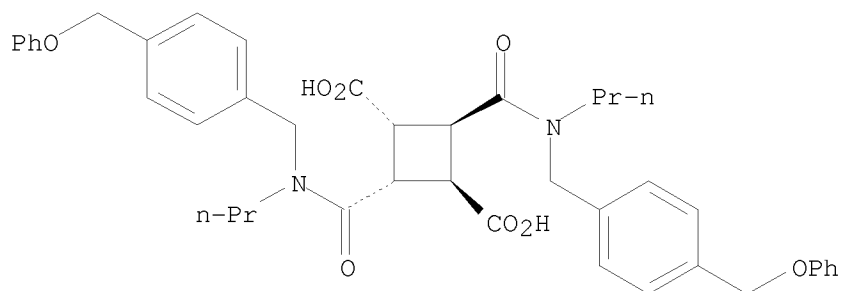
Relative stereochemistry.



RN 171349-23-8 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-(  
(phenoxy)methyl)phenyl)methyl]propylamino]carbonyl]-,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

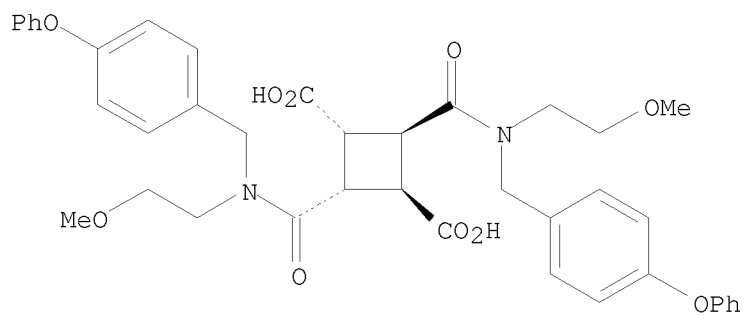
Relative stereochemistry.



RN 171349-24-9 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-methoxyethyl)[(4-  
phenoxyphenyl)methyl]amino]carbonyl]-,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

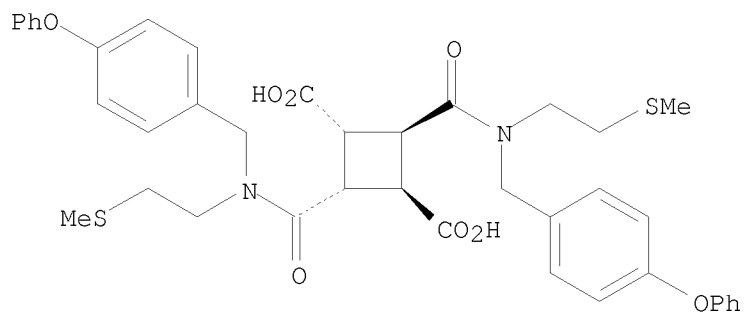
Relative stereochemistry.



RN 171349-25-0 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-(methylthio)ethyl)[(4-  
phenoxyphenyl)methyl]amino]carbonyl]-,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

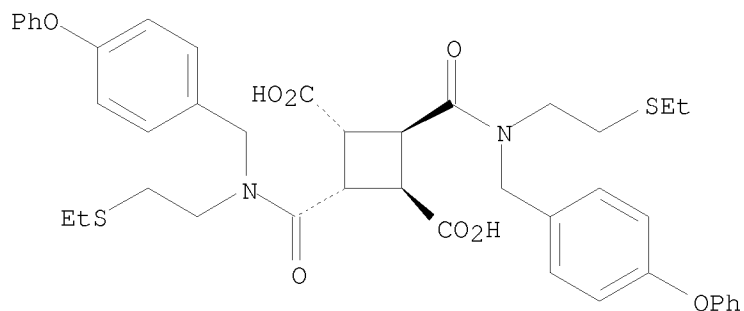
Relative stereochemistry.



RN 171349-26-1 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-(ethylthio)ethyl)[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

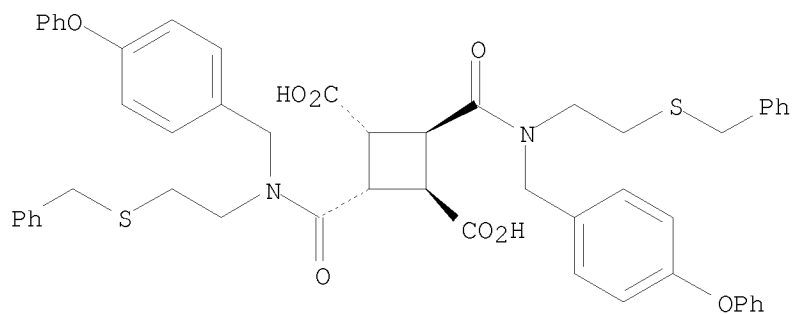
Relative stereochemistry.



RN 171349-27-2 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-phenoxyphenyl)methyl][2-[(phenylmethyl)thio]ethyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

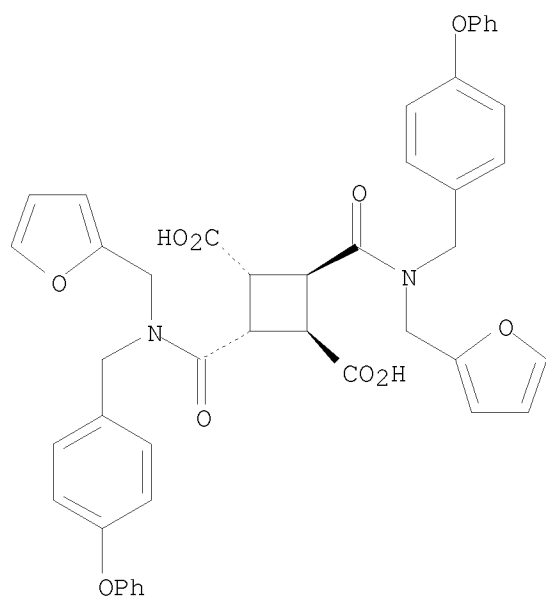
Relative stereochemistry.



RN 171349-28-3 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-furanylmethyl)[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

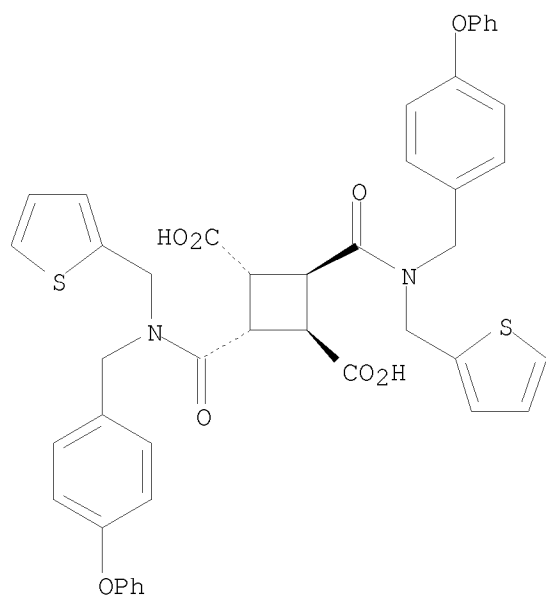
Relative stereochemistry.



RN 171349-29-4 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-phenoxyphenyl)methyl](2-thienylmethyl)amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

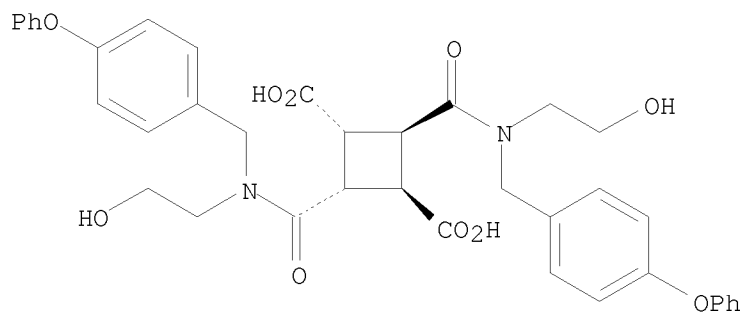
Relative stereochemistry.



RN 171349-30-7 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-hydroxyethyl)[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

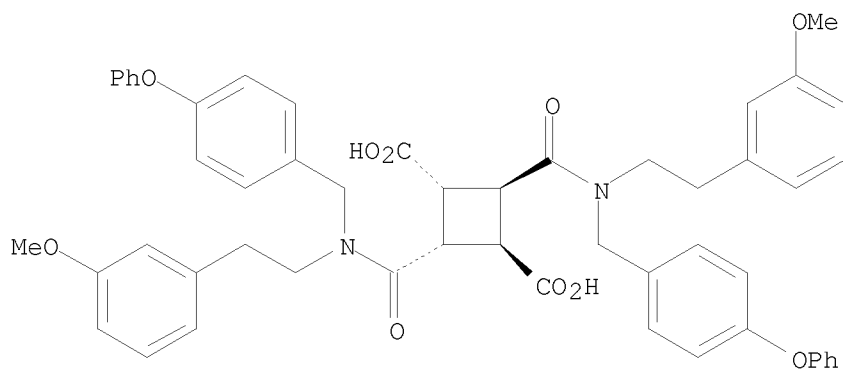
Relative stereochemistry.



RN 171349-31-8 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-(3-methoxyphenyl)ethyl)amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

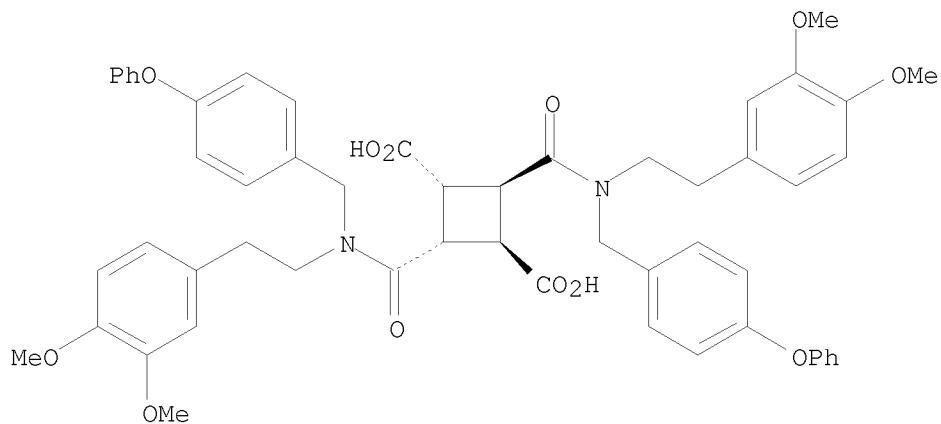
Relative stereochemistry.



RN 171349-32-9 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-(3,4-dimethoxyphenyl)ethyl)amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

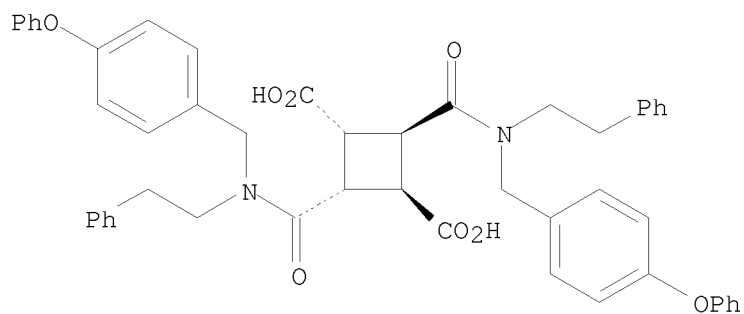
Relative stereochemistry.



RN 171349-33-0 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-phenoxyphenyl)methyl(2-phenylethyl)amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

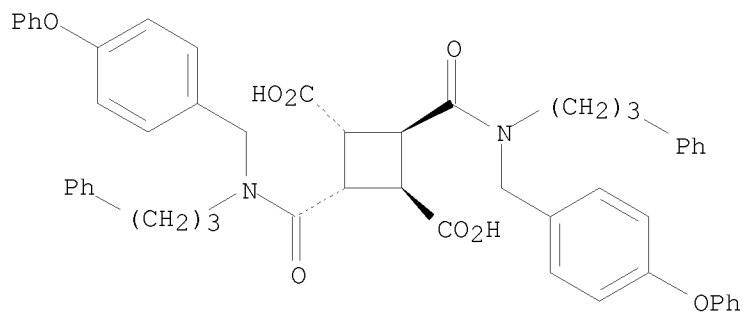
Relative stereochemistry.



RN 171349-34-1 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-phenoxyphenyl)methyl](3-phenylpropyl)amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

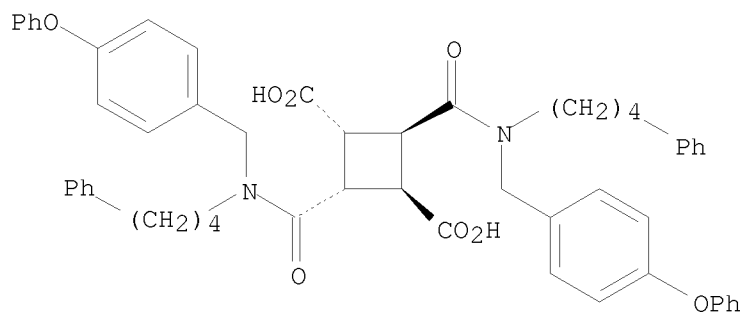
Relative stereochemistry.



RN 171349-35-2 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-phenoxyphenyl)methyl](4-phenylbutyl)amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

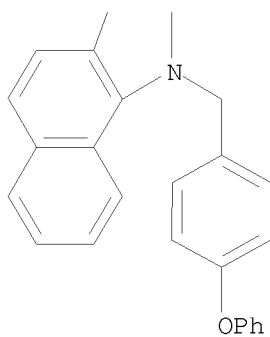
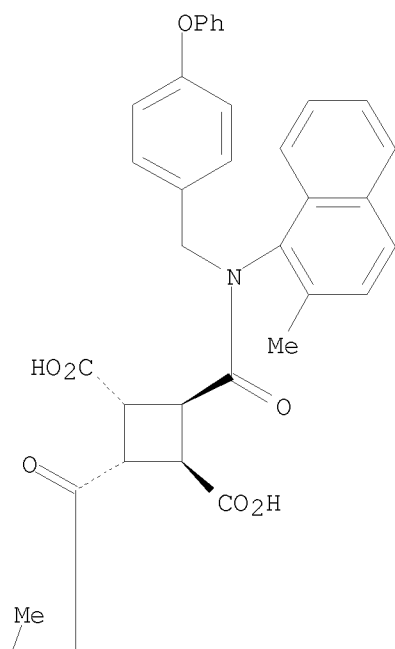
Relative stereochemistry.



RN 171349-36-3 CAPLUS

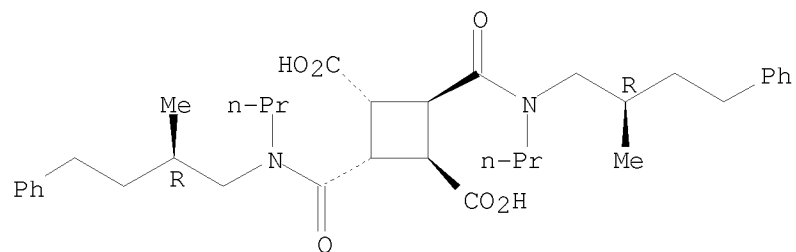
CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-methyl-1-naphthalenyl)[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



RN 171349-37-4 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[ (2-methyl-4-phenylbutyl)propylamino]carbonyl]-, [1 $\alpha$ , 2 $\alpha$  (R\*), 3 $\beta$ , 4 $\beta$  (R\*)]- (9CI) (CA INDEX NAME)

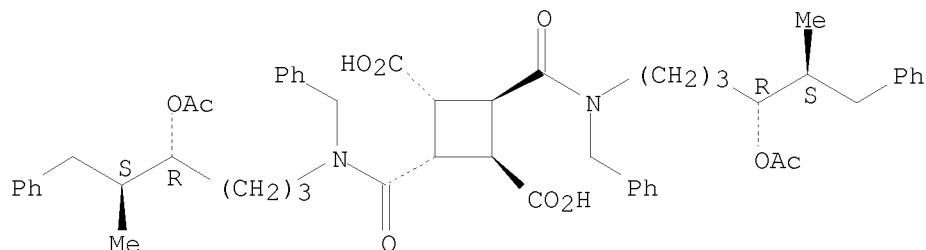
Relative stereochemistry.



RN 171349-39-6 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(acetyloxy)-5-methyl-6-phenylhexyl](phenylmethyl)amino]carbonyl]-, [1 $\alpha$ ,2 $\alpha$ (4R\*,5S\*),3 $\beta$ ,4 $\beta$ (4R\*,5S\*)]- (9CI) (CA INDEX NAME)

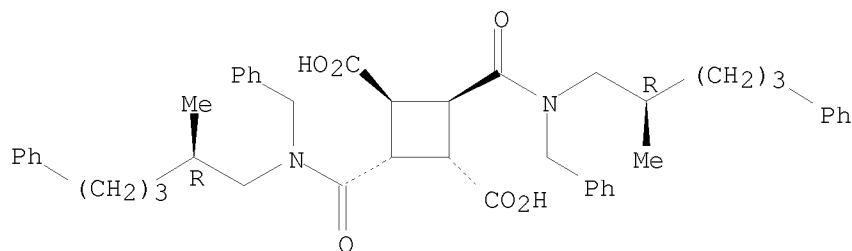
Relative stereochemistry.



RN 171349-40-9 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(2R)-2-methyl-5-phenylpentyl](phenylmethyl)amino]carbonyl]-, (1 $\alpha$ ,2 $\beta$ ,3 $\beta$ ,4 $\alpha$ )- (CA INDEX NAME)

Absolute stereochemistry.

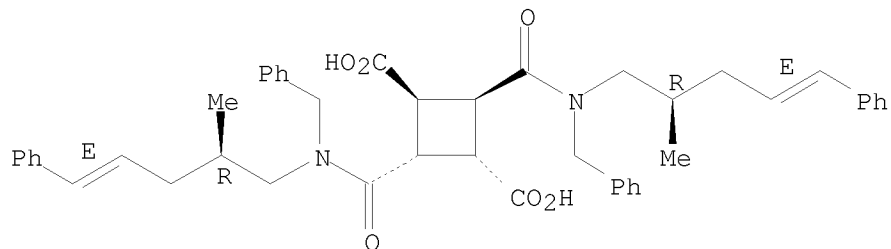


RN 171349-41-0 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(2R,4E)-2-methyl-5-phenyl-4-penten-1-yl](phenylmethyl)amino]carbonyl]-, (1 $\alpha$ ,2 $\beta$ ,3 $\beta$ ,4 $\alpha$ )- (CA INDEX NAME)

Absolute stereochemistry.

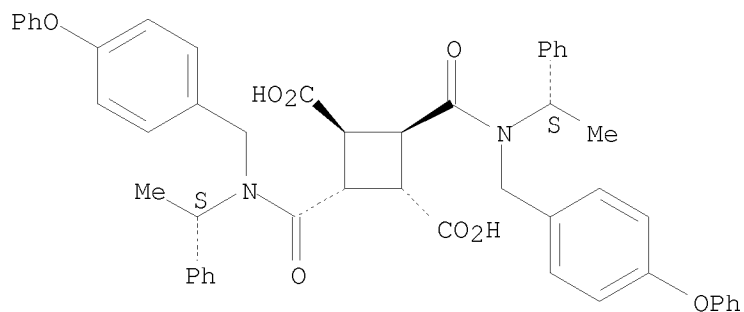
Double bond geometry as shown.



RN 171349-42-1 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(4-phenoxyphenyl)methyl][(1S)-1-phenylethyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

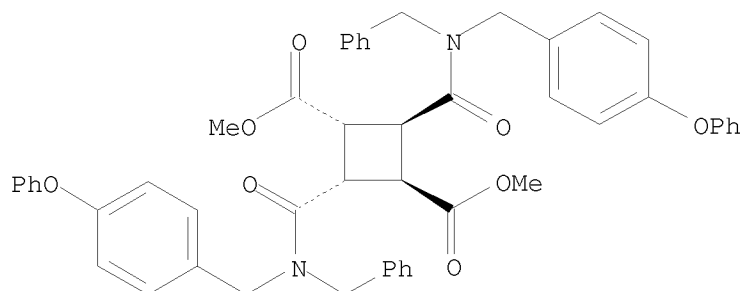
Absolute stereochemistry.



RN 171349-43-2 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(4-phenoxyphenyl)methyl](phenylmethyl)amino]carbonyl]-, dimethyl ester, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

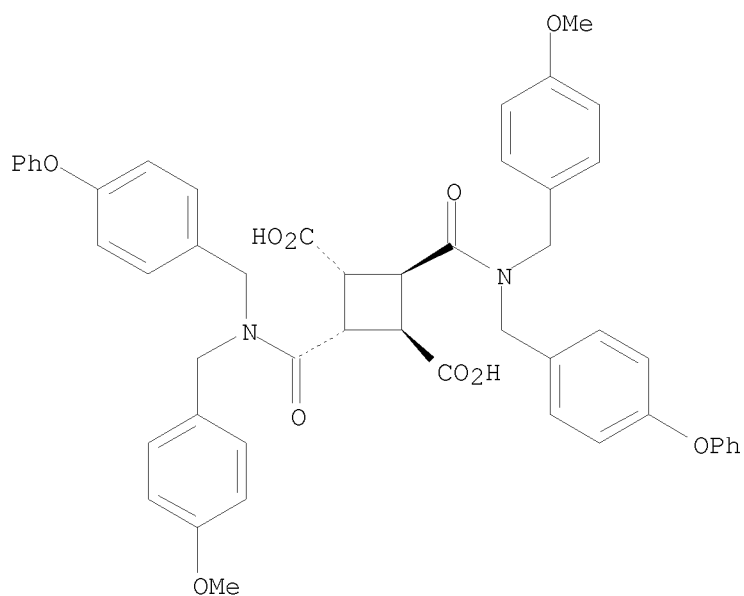
Relative stereochemistry.



RN 171349-44-3 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(4-methoxyphenyl)methyl][(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

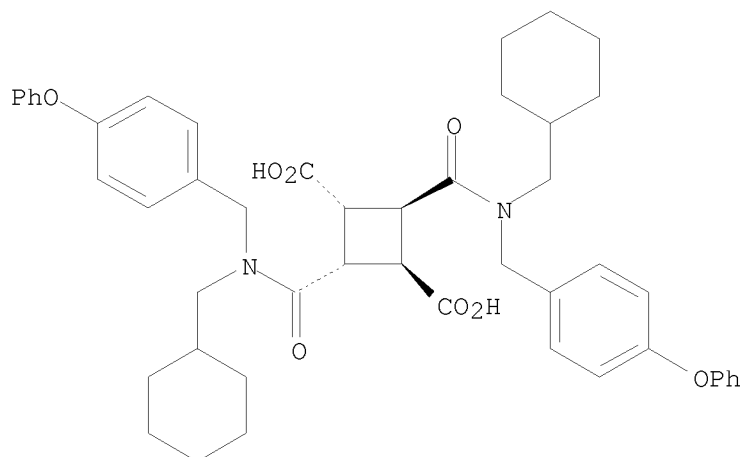
Relative stereochemistry.



RN 171349-45-4 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[ (cyclohexylmethyl) [(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

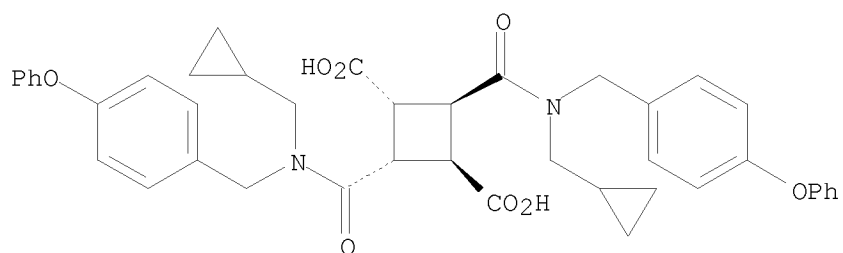
Relative stereochemistry.



RN 171349-47-6 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[ (cyclopropylmethyl) [(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

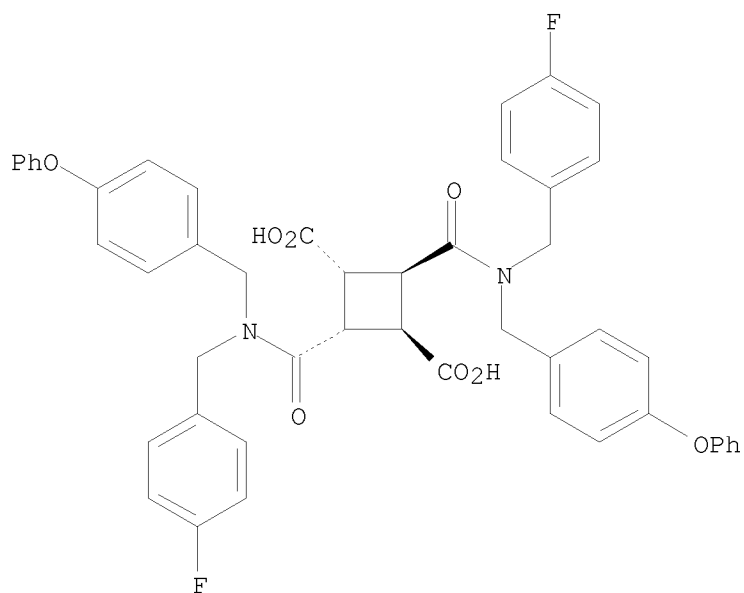
Relative stereochemistry.



RN 171349-48-7 CAPLUS

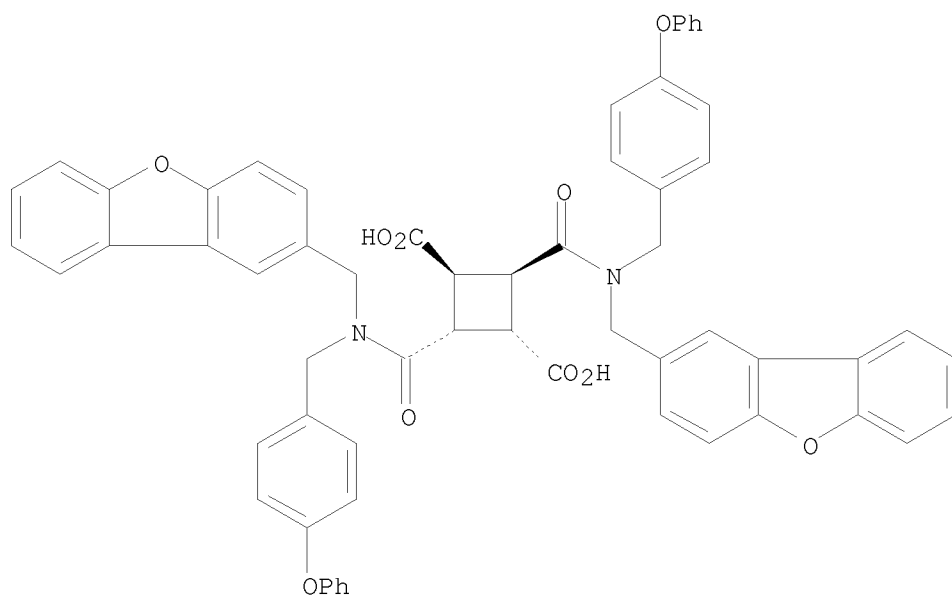
CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(4-fluorophenyl)methyl] [(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.



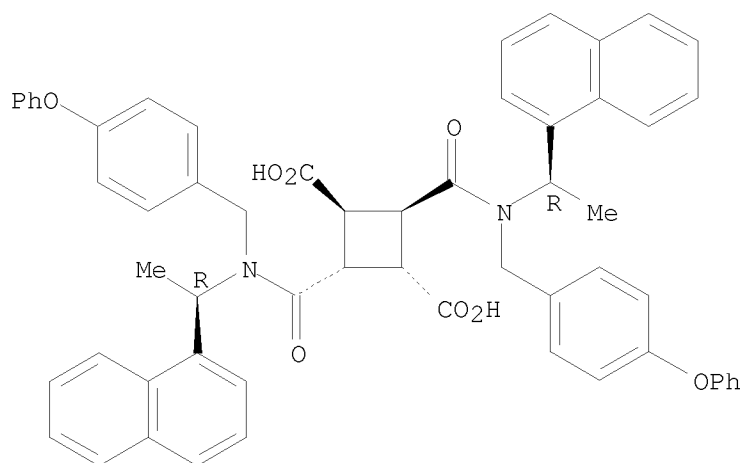
RN 171349-49-8 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(2-dibenzofuranylmethyl)[(4-phenoxyphenyl)methyl]amino]carbonyl]-,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



RN 171349-50-1 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(1R)-1-(1-naphthalenyl)ethyl][(4-phenoxyphenyl)methyl]amino]carbonyl]-,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

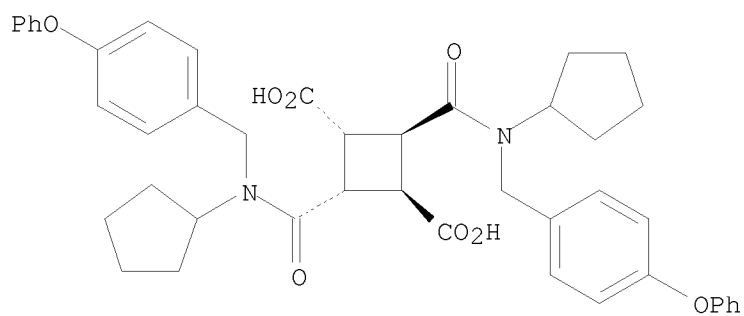
Absolute stereochemistry.



RN 171349-51-2 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[cyclopentyl[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

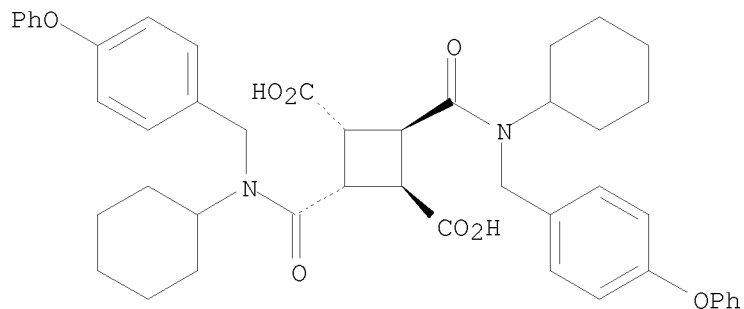
Relative stereochemistry.



RN 171349-52-3 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[cyclohexyl[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

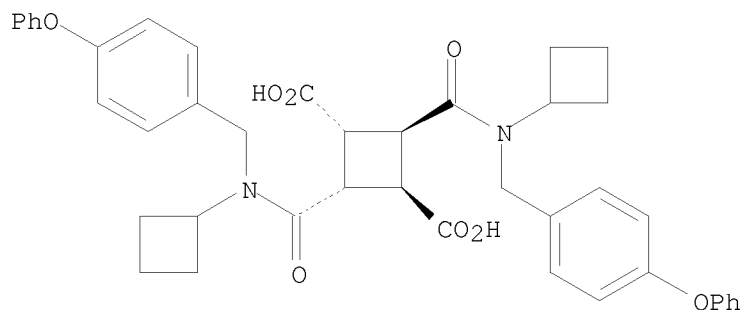
Relative stereochemistry.



RN 171349-53-4 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[cyclobutyl[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

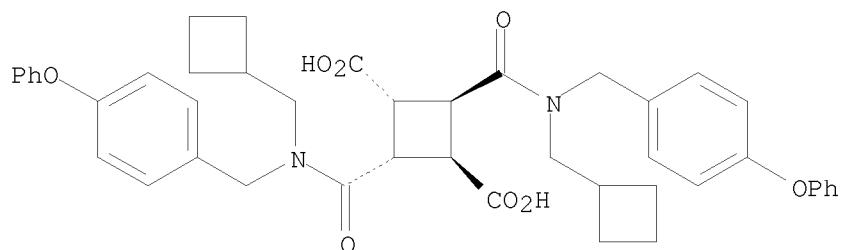
Relative stereochemistry.



RN 171349-54-5 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(cyclobutylmethyl)[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

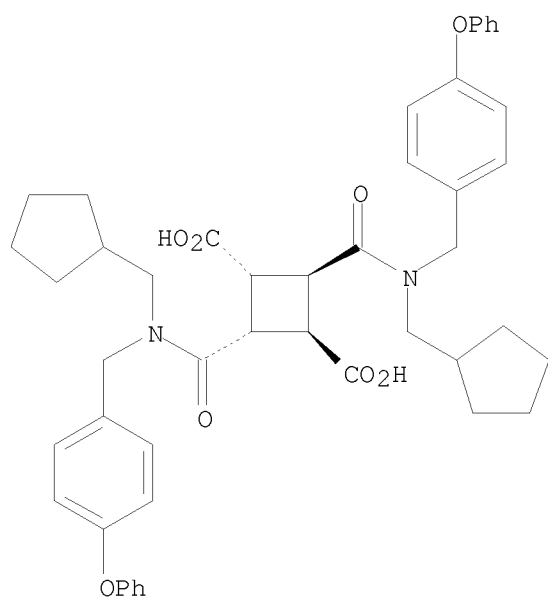
Relative stereochemistry.



RN 171349-55-6 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(cyclopentylmethyl)[(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

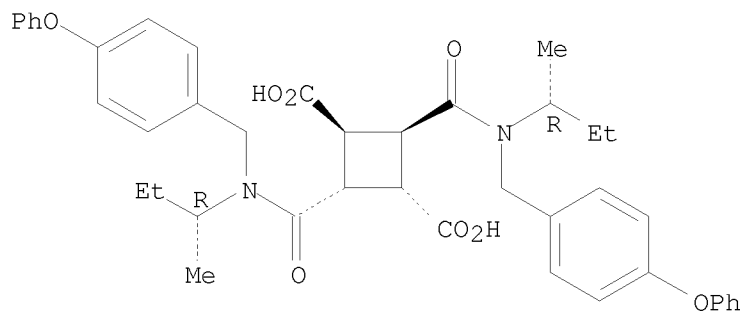
Relative stereochemistry.



RN 171349-56-7 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(1R)-1-methylpropyl][(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (CA INDEX NAME)

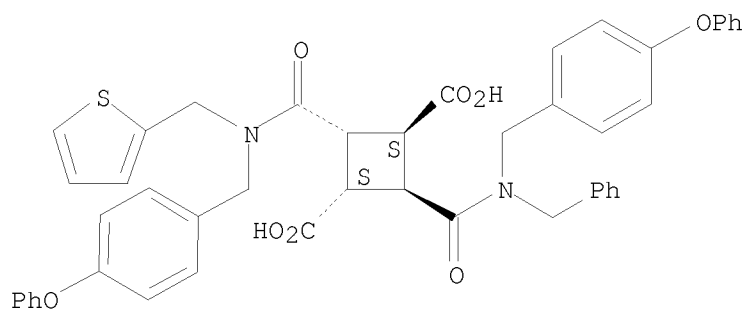
Absolute stereochemistry.



RN 171349-57-8 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2-[[[(4-phenoxyphenyl)methyl](phenylmethyl)amino]carbonyl]-4-[[[(4-phenoxyphenyl)methyl](2-thienylmethyl)amino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (9CI) (CA INDEX NAME)

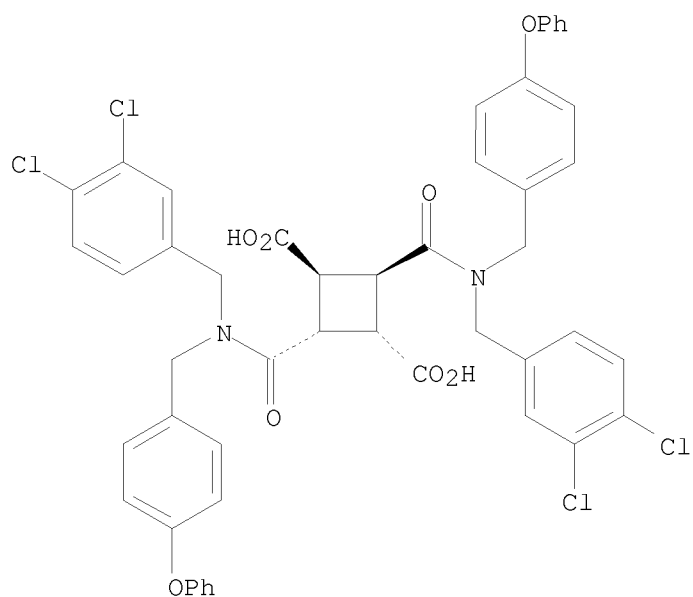
Relative stereochemistry.



RN 171349-58-9 CAPLUS

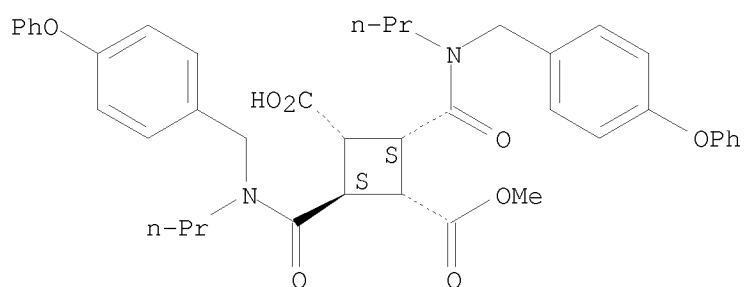
CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[(3,4-dichlorophenyl)methyl][(4-phenoxyphenyl)methyl]amino]carbonyl]-, (1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



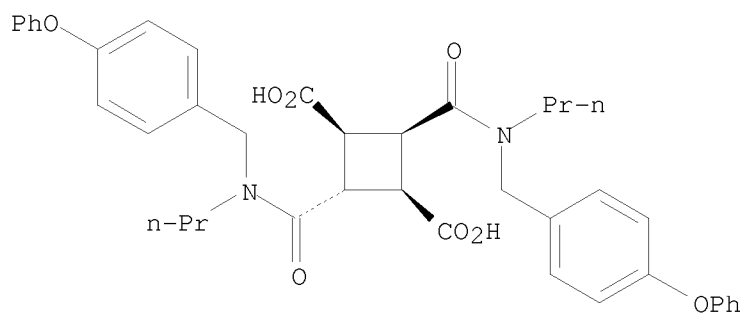
RN 171483-63-9 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, monomethyl ester, (1 $\alpha$ ,2 $\alpha$ ,3 $\alpha$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.



RN 171483-64-0 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\alpha$ ,4 $\beta$ )- (CA INDEX NAME)

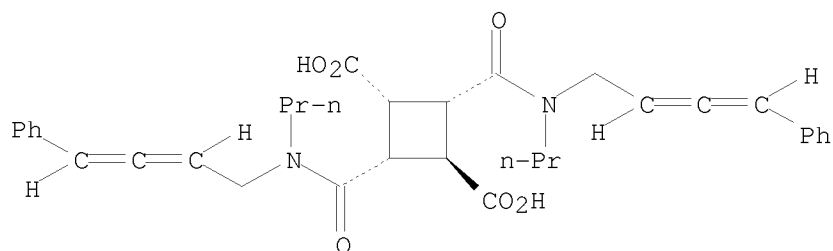
Relative stereochemistry.



RN 171483-65-1 CAPLUS

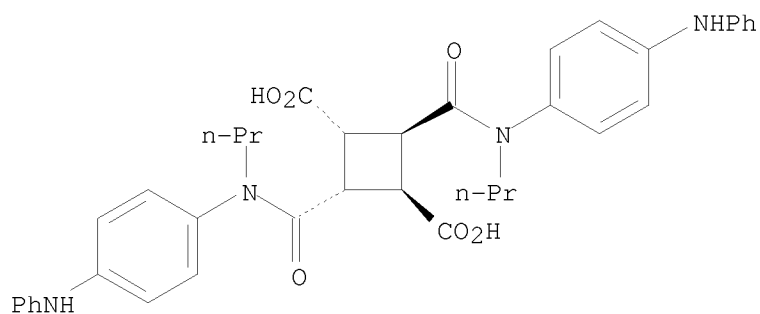
CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-phenyl-2,3-butadienyl)propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\alpha$ ,4 $\beta$ )-(9CI) (CA INDEX NAME)

Relative stereochemistry.



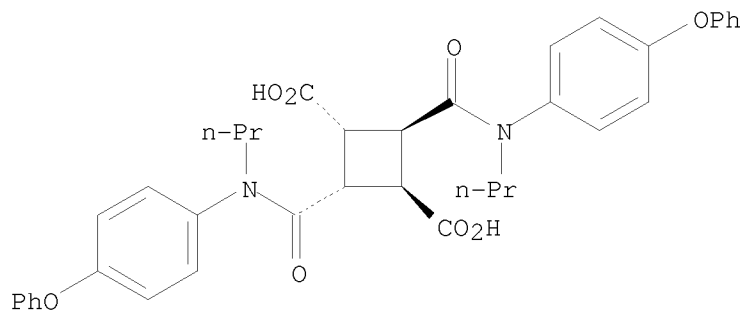
RN 171483-66-2 CAPLUS  
CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(phenylamino)phenyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )-(CA INDEX NAME)

Relative stereochemistry.



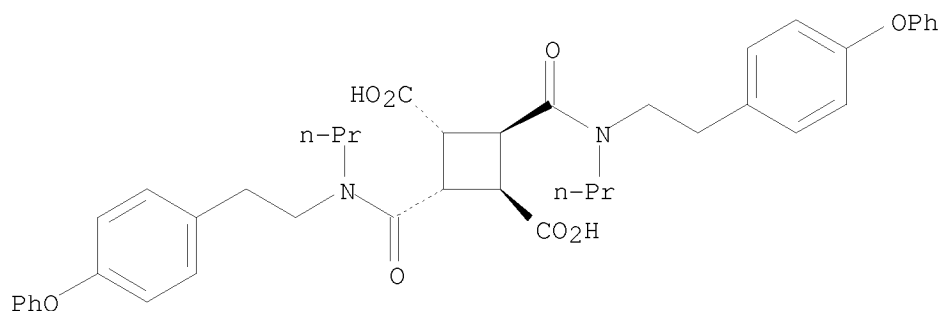
RN 171483-67-3 CAPLUS  
CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-phenoxyphenyl)propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )-(CA INDEX NAME)

Relative stereochemistry.



RN 171483-68-4 CAPLUS  
CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[2-(4-phenoxyphenyl)ethyl]propylamino]carbonyl]-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )-(CA INDEX NAME)

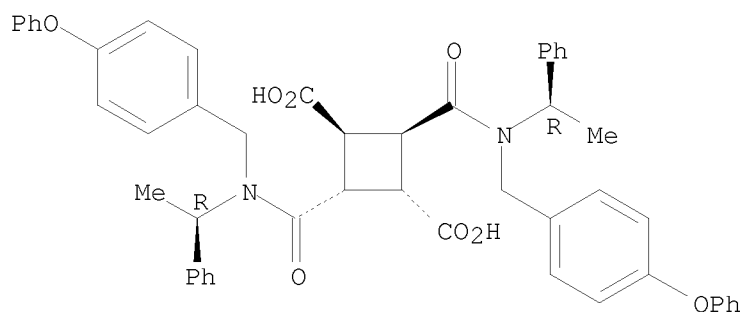
Relative stereochemistry.



RN 171483-69-5 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[(4-phenoxyphenyl)methyl][(1R)-1-phenylethyl]amino]carbonyl]-, (1 $\alpha$ ,2 $\beta$ ,3 $\beta$ ,4 $\alpha$ )- (CA INDEX NAME)

Absolute stereochemistry.



L5 ANSWER 11 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1995:902590 CAPLUS

DOCUMENT NUMBER: 123:313433

ORIGINAL REFERENCE NO.: 123:56175a,56178a

TITLE: Cyclobutane derivatives as inhibitors of squalene synthetase and protein farnesyltransferase

INVENTOR(S): Baker, William R.; Rockway, Todd W.; Donner, B. Gregory; Shen, Wang; Rosenberg, Saul H.; Fakhoury, Stephen A.; O'Connor, Stephen J.; Stout, David M.; Fung, Anthony K. L.; et al.

PATENT ASSIGNEE(S): Abbott Laboratories, USA

SOURCE: PCT Int. Appl., 223 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 3

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WO 9512572	A1	19950511	WO 1994-US12132	19941020
W: CA, JP				
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
CA 2152822	A1	19950511	CA 1994-2152822	19941020
EP 677039	A1	19951018	EP 1994-931987	19941020
EP 677039	B1	19990310		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LI, LU, NL, PT, SE				
JP 08505646	T	19960618	JP 1994-513255	19941020

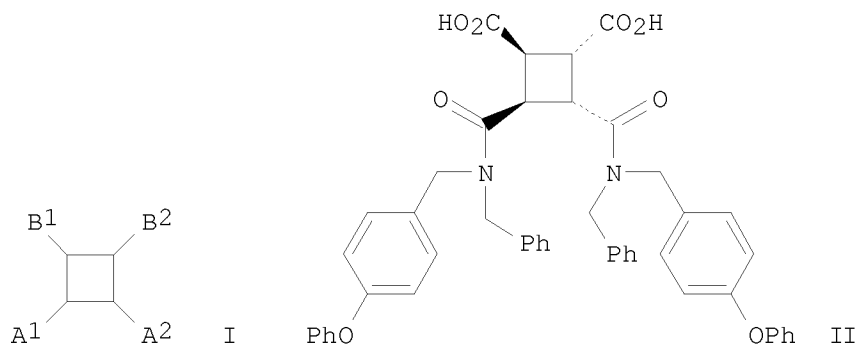
AT 177420  
ES 2130452  
PRIORITY APPLN. INFO.:

T 19990315  
T3 19990701

AT 1994-931987  
ES 1994-931987  
US 1993-147708  
US 1994-289711  
WO 1994-US12132

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A 19931104  
A 19940909  
W 19941020

OTHER SOURCE(S): MARPAT 123:313433  
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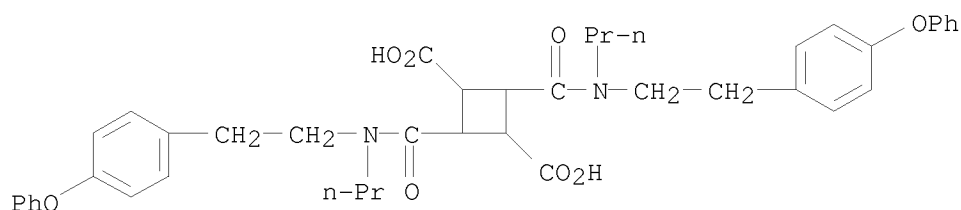
AB The invention provides compds. I [A1, A2 = -XC(O)G, -XC(S)G, -(CH2)<sub>q</sub>NR1R2; X = bond, CH2, O, S, (un)substituted NH; G = R2, NR1R2, OR2, SR2; R1 = H, alkyl, alkenyl, (un)substituted aryl, heterocyclyl, etc.; R2 = alkenyl, (un)substituted aryl, heterocyclyl, etc.; q = 0-2; B1, B2 = CH2OH, CH:NOH, WR3, addnl. carbonyl-containing groups; W = bond, alkylene, alkenylene, CONH, NHCONH; R3 = various (un)substituted heterocyclic groups or squaric acid residue]. Also disclosed are preparation processes, intermediates, pharmaceutical compns., and treatment of hypercholesterolemic disorders, cancer, or fungal infections using the compds. I inhibit biosynthesis of cholesterol (and also fungal growth) by inhibiting squalene synthetase. I also inhibit farnesylation of the oncogene protein Ras by inhibiting protein farnesyltransferase (no data). For example, reaction of anti-1,2,3,4-cyclobutanetetracarboxylic dianhydride with 2 equiv 4-PhOC6H4CH2NHCH2Ph in THF at 25°, followed by workup and chromatog. of the isomeric products, gave 6% title compound II. In an in vitro test, II at 10 μM gave 99% inhibition of rat liver microsomal squalene synthetase. Over 160 synthetic examples (approx. 115 compds. I with data) are given, with similar test data for most compds.

IT 169943-31-1P 169943-32-2P 169943-33-3P  
169943-34-4P 169943-35-5P 169943-36-6P  
169943-37-7P 169943-38-8P 169943-39-9P  
RL: BYP (Byproduct); PREP (Preparation)

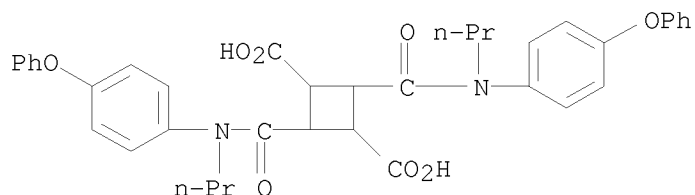
(byproduct; preparation of cyclobutane derivs. as inhibitors of squalene synthetase and protein farnesyltransferase)

RN 169943-31-1 CAPLUS

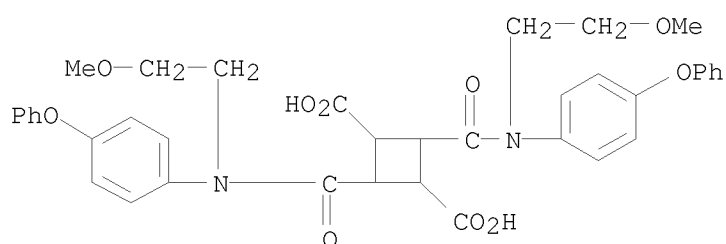
CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[2-(4-phenoxyphenyl)ethyl]propylamino]carbonyl]- (CA INDEX NAME)



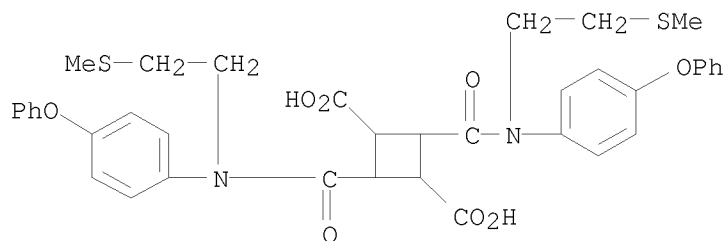
RN 169943-32-2 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[ (4-phenoxyphenyl)propylamino]carbonyl]- (CA INDEX NAME)



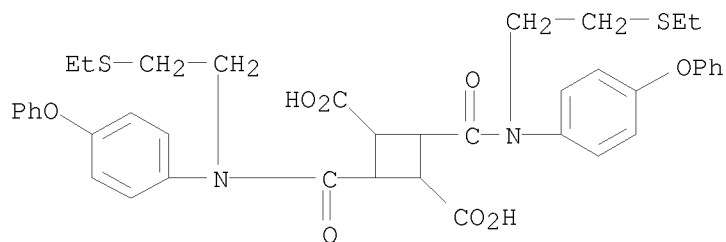
RN 169943-33-3 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[ (2-methoxyethyl) (4-phenoxyphenyl)amino]carbonyl]- (CA INDEX NAME)



RN 169943-34-4 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[ [2-(methylthio)ethyl] (4-phenoxyphenyl)amino]carbonyl]- (CA INDEX NAME)

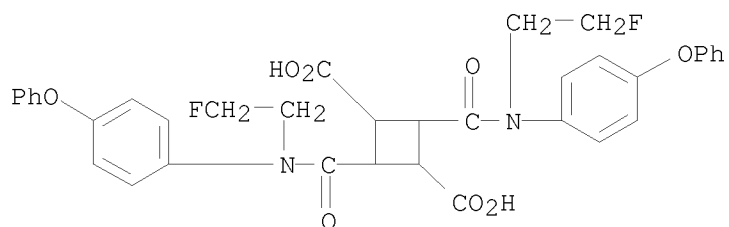


RN 169943-35-5 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[ [2-(ethylthio)ethyl] (4-phenoxyphenyl)amino]carbonyl]- (CA INDEX NAME)



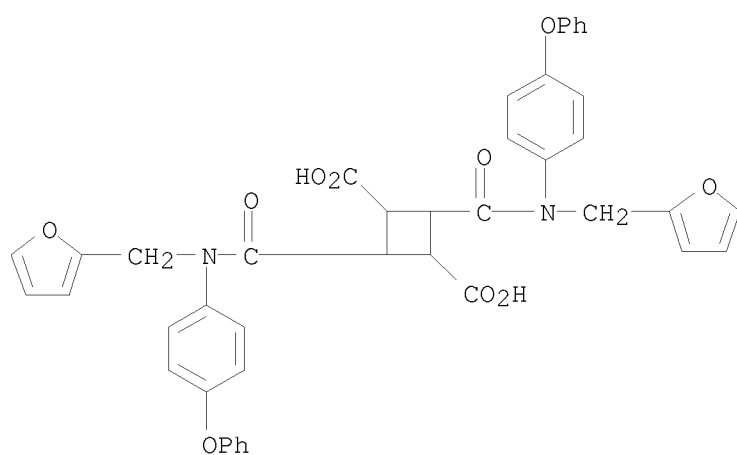
RN 169943-36-6 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[ (2-fluoroethyl) (4-phenoxyphenyl) amino]carbonyl]- (CA INDEX NAME)



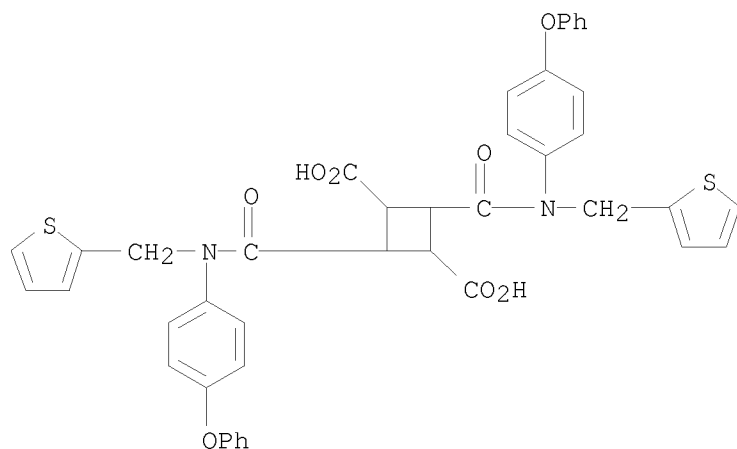
RN 169943-37-7 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[ (2-furanylmethyl) (4-phenoxyphenyl) amino]carbonyl]- (CA INDEX NAME)



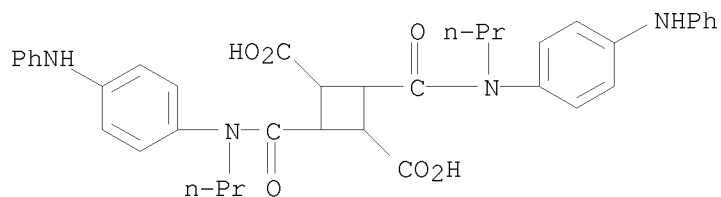
RN 169943-38-8 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[ (4-phenoxyphenyl) (2-thienylmethyl) amino]carbonyl]- (CA INDEX NAME)



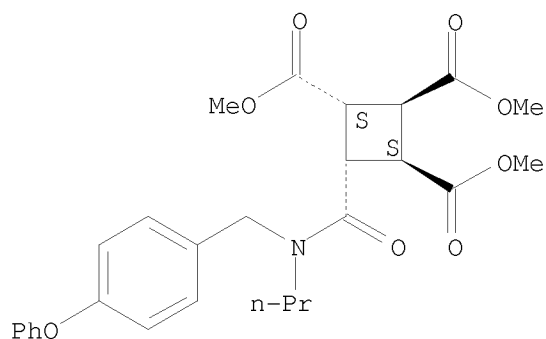
RN 169943-39-9 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis[[[4-(phenylamino)phenyl]propylamino]carbonyl]- (CA INDEX NAME)



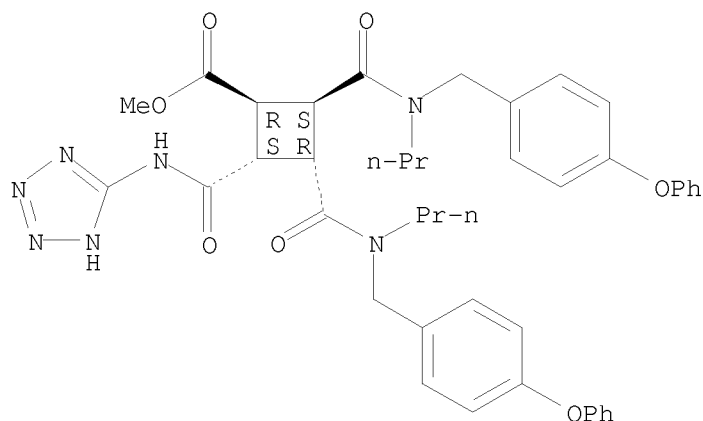
IT 169942-85-2P 169943-03-7P 169943-05-9P  
 169943-06-0P 169943-07-1P 170207-72-4P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (intermediate; preparation of cyclobutane derivs. as inhibitors of squalene  
 synthetase and protein farnesyltransferase)  
 RN 169942-85-2 CAPLUS  
 CN 1,2,3-Cyclobutanetricarboxylic acid,  
 4-[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, trimethyl ester,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )-(9CI) (CA INDEX NAME)

Relative stereochemistry.



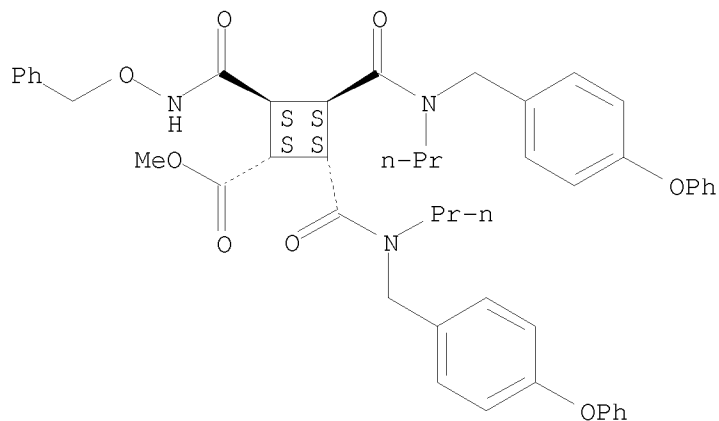
RN 169943-03-7 CAPLUS  
 CN Cyclobutanecarboxylic acid, 2,3-bis[[[(4-  
 phenoxyphenyl)methyl]propylamino]carbonyl]-4-[(1H-tetrazol-5-  
 ylamino)carbonyl]-, methyl ester, (1R,2S,3R,4S)-rel- (9CI) (CA INDEX  
 NAME)

Relative stereochemistry.



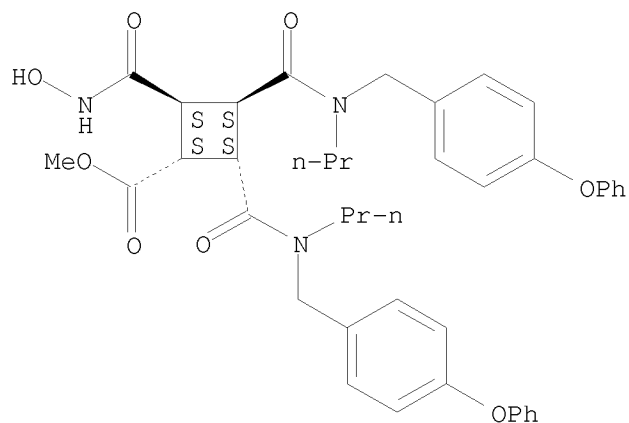
RN 169943-05-9 CAPLUS  
 CN Cyclobutanecarboxylic acid, 2,3-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-4-[[[(phenylmethoxy)amino]carbonyl]-, methyl ester, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

Relative stereochemistry.



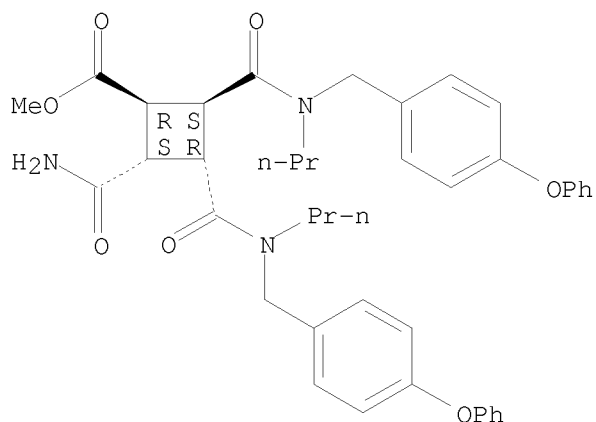
RN 169943-06-0 CAPLUS  
 CN Cyclobutanecarboxylic acid, 2-[(hydroxyamino)carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, methyl ester, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

Relative stereochemistry.



RN 169943-07-1 CAPLUS  
 CN Cyclobutanecarboxylic acid, 2-(aminocarbonyl)-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, methyl ester, (1R,2S,3R,4S)-rel- (CA INDEX NAME)

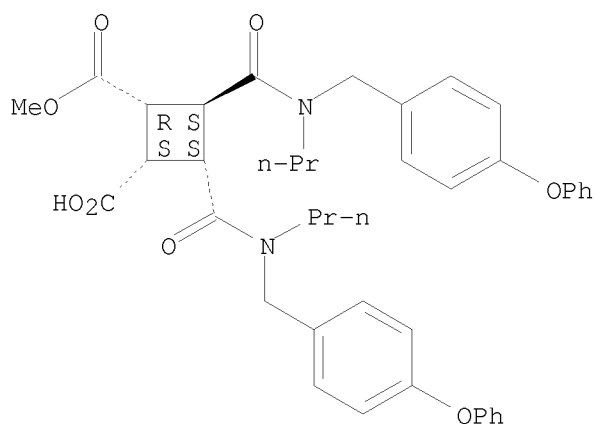
Relative stereochemistry.



RN 170207-72-4 CAPLUS

CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, monomethyl ester, (1R,2S,3S,4S)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



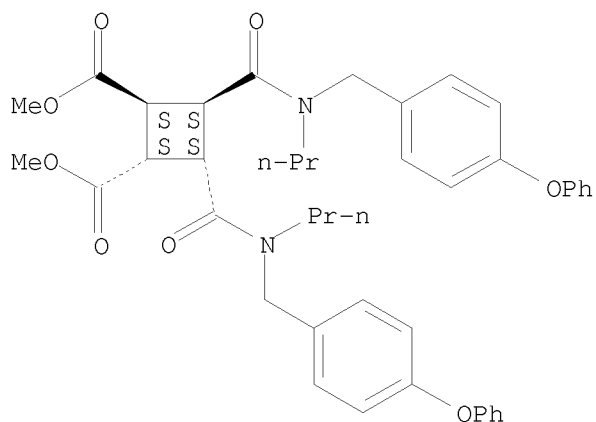
IT 169942-55-6P 169942-56-7P

RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); RCT (Reactant); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)  
(preparation of cyclobutane derivs. as inhibitors of squalene synthetase and protein farnesyltransferase)

RN 169942-55-6 CAPLUS

CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, dimethyl ester, (1R,2R,3R,4R)-rel- (9CI) (CA INDEX NAME)

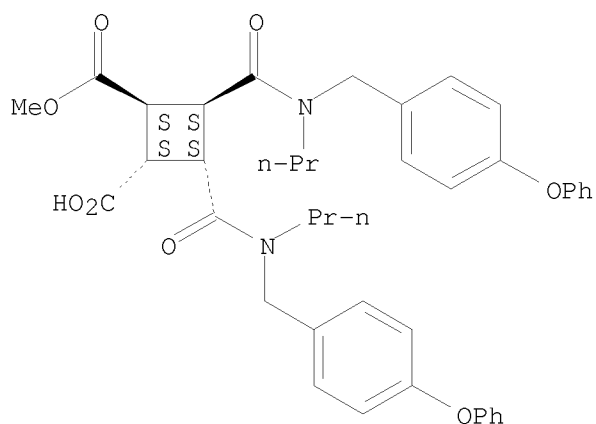
Relative stereochemistry.



RN 169942-56-7 CAPLUS

CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, monomethyl ester, (1R,2R,3R,4R)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



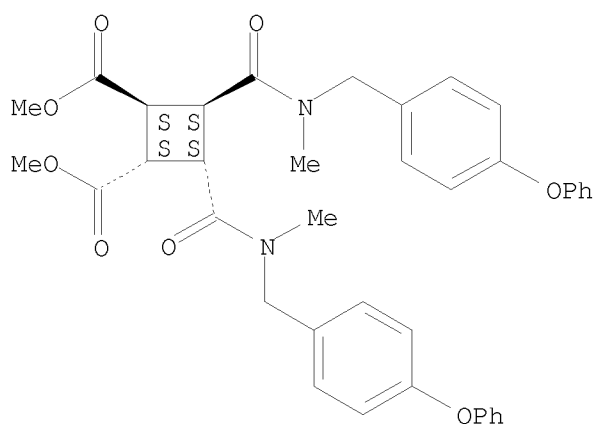
IT 169942-41-0P 169942-53-4P 169942-57-8P  
169942-58-9P 169942-63-6P 169942-65-8P  
169942-67-0P 169942-68-1P 169942-69-2P  
169942-70-5P 169944-08-5P 169944-09-6P

RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)  
(preparation of cyclobutane derivs. as inhibitors of squalene synthetase and protein farnesyltransferase)

RN 169942-41-0 CAPLUS

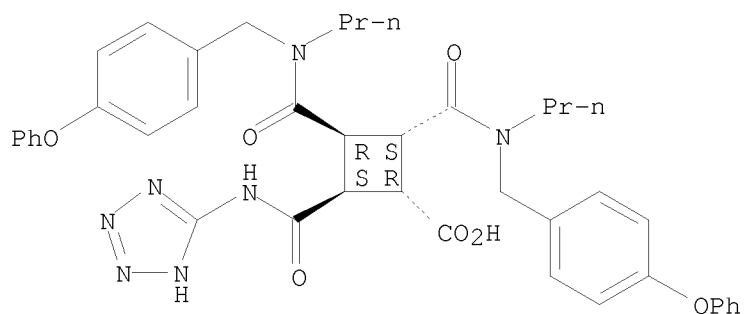
CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis[[methyl[(4-phenoxyphenyl)methyl]amino]carbonyl]-, dimethyl ester, (1R,2R,3R,4R)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



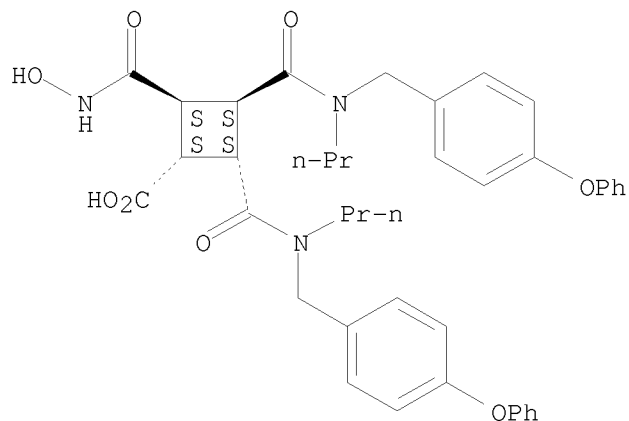
RN 169942-53-4 CAPLUS  
 CN Cyclobutanecarboxylic acid, 2,3-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-4-[(1H-tetrazol-5-ylamino)carbonyl]-, (1R,2S,3R,4S)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



RN 169942-57-8 CAPLUS  
 CN Cyclobutanecarboxylic acid, 2-[(hydroxyamino)carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1R,2R,3R,4R)-rel- (CA INDEX NAME)

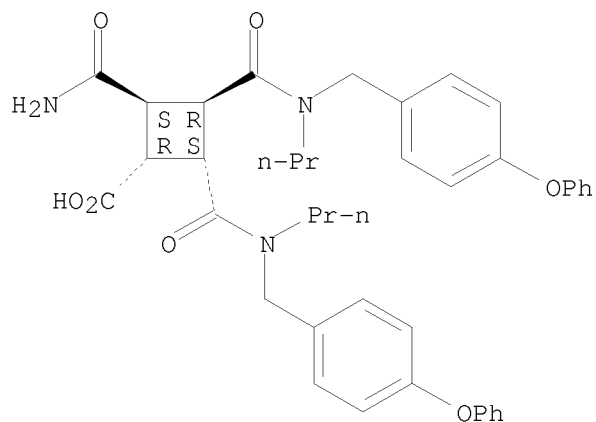
Relative stereochemistry.



RN 169942-58-9 CAPLUS  
 CN Cyclobutanecarboxylic acid, 2-(aminocarbonyl)-3,4-bis[[[(4-

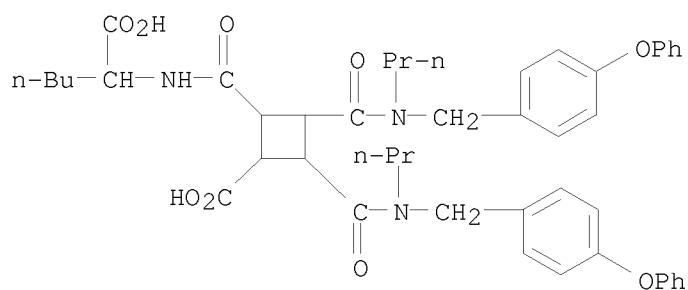
phenoxyphenyl)methyl]propylamino]carbonyl]-, (1R,2S,3R,4S)-rel- (CA INDEX NAME)

Relative stereochemistry.



RN 169942-63-6 CAPLUS

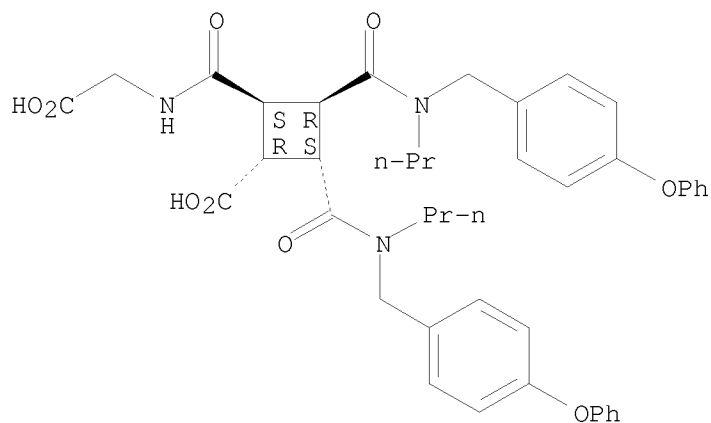
CN Cyclobutanecarboxylic acid, 2-[[[(1-carboxypentyl)amino]carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]- (CA INDEX NAME)



RN 169942-65-8 CAPLUS

CN Cyclobutanecarboxylic acid, 2-[[[(carboxymethyl)amino]carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1R,2S,3R,4S)-rel- (CA INDEX NAME)

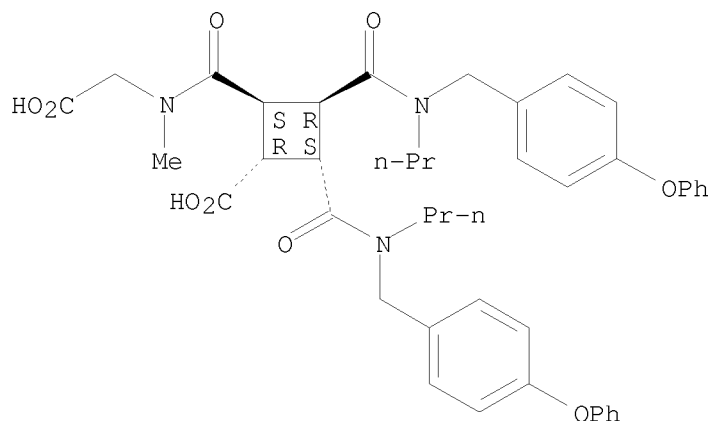
Relative stereochemistry.



RN 169942-67-0 CAPLUS

CN Cyclobutanecarboxylic acid, 2-[[[(carboxymethyl)methylamino]carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1R,2S,3R,4S)-rel- (CA INDEX NAME)

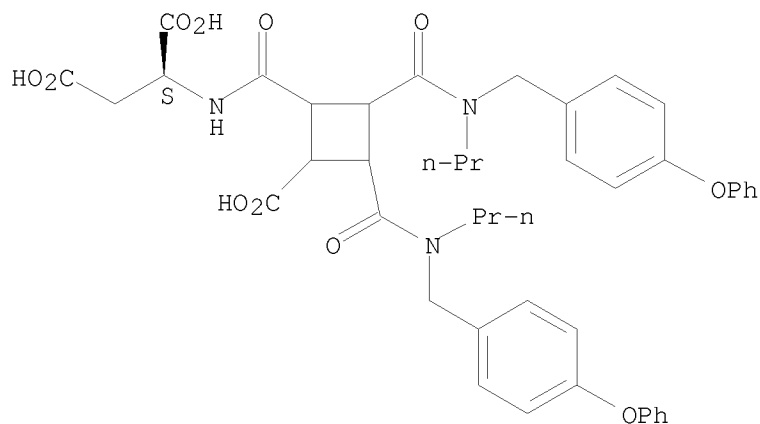
Relative stereochemistry.



RN 169942-68-1 CAPLUS

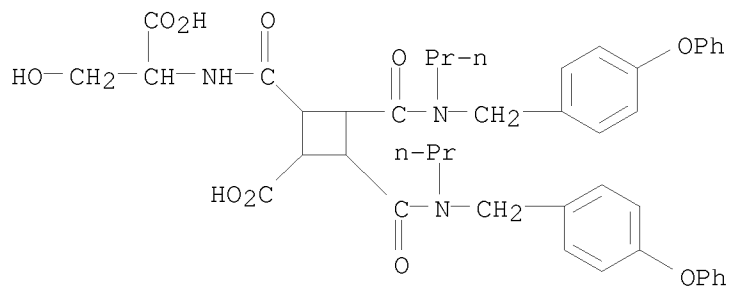
CN L-Aspartic acid, N-[[2-carboxy-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]cyclobutyl]carbonyl]- (CA INDEX NAME)

Absolute stereochemistry.



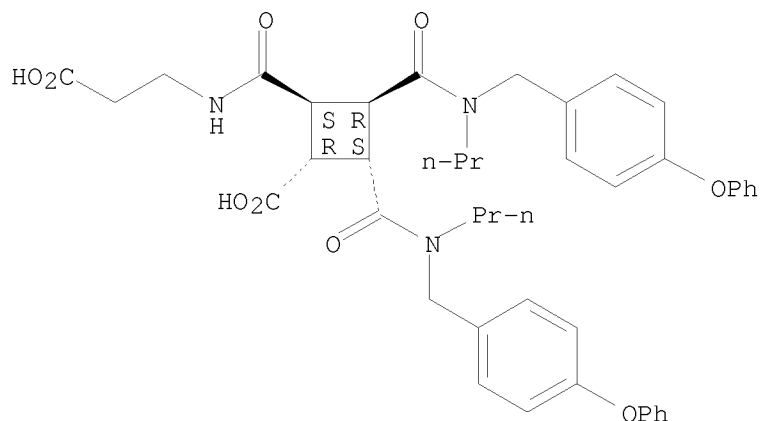
RN 169942-69-2 CAPLUS

CN Cyclobutanecarboxylic acid, 2-[[[(1-carboxy-2-hydroxyethyl)amino]carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]- (CA INDEX NAME)

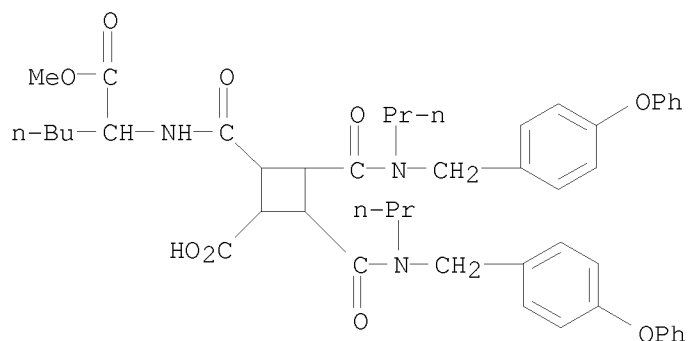


RN 169942-70-5 CAPLUS  
 CN Cyclobutanecarboxylic acid, 2-[[[(2-carboxyethyl)amino]carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, (1R,2S,3R,4S)-rel- (CA INDEX NAME)

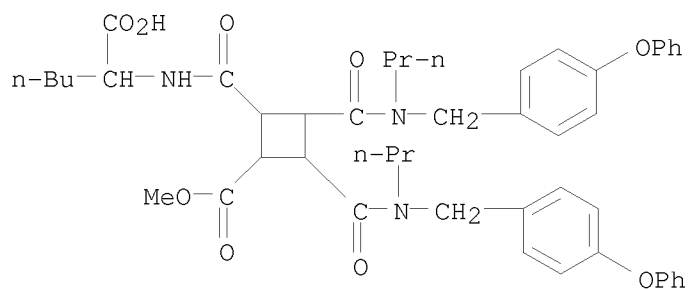
Relative stereochemistry.



RN 169944-08-5 CAPLUS  
 CN Cyclobutanecarboxylic acid, 2-[[[(1-(methoxycarbonyl)pentyl)amino]carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]- (CA INDEX NAME)



RN 169944-09-6 CAPLUS  
 CN Cyclobutanecarboxylic acid, 2-[[[(1-carboxypentyl)amino]carbonyl]-3,4-bis[[[(4-phenoxyphenyl)methyl]propylamino]carbonyl]-, 1-methyl ester (CA INDEX NAME)



REFERENCE COUNT: 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 12 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1989:74416 CAPLUS  
DOCUMENT NUMBER: 110:74416  
ORIGINAL REFERENCE NO.: 110:12283a,12284a  
TITLE: Three puzzles for organic laboratory  
AUTHOR(S): Todd, David; Pickering, Miles  
CORPORATE SOURCE: Worcester Polytech. Inst., Worcester, MA, 01609, USA  
SOURCE: Journal of Chemical Education (1988), 65(12), 1100-2  
CODEN: JCEDA8; ISSN: 0021-9584  
DOCUMENT TYPE: Journal  
LANGUAGE: English

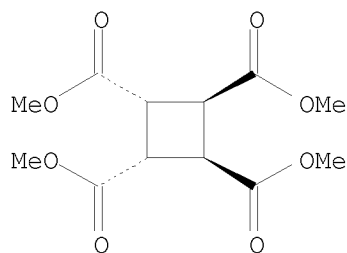
AB Three puzzles are described for organic labs., each of which can be solved using m.p. alone, and each of which involves work at the 100-200-mg scale. The 1st puzzle involves determining the product of the Friedel-Crafts acylation of 2-chlorotoluene with AcCl, the 2nd puzzle involves the determination of the product of the nucleophilic substitution of 3,4-dichloronitrobenzene with Na methoxide, and the 3rd puzzle involves determining the isomer formed from the photodimerization of maleic anhydride.

IT 1032-95-7  
RL: MSC (Miscellaneous)  
(m.p. determination of, laboratory experiment in)

RN 1032-95-7 CAPLUS

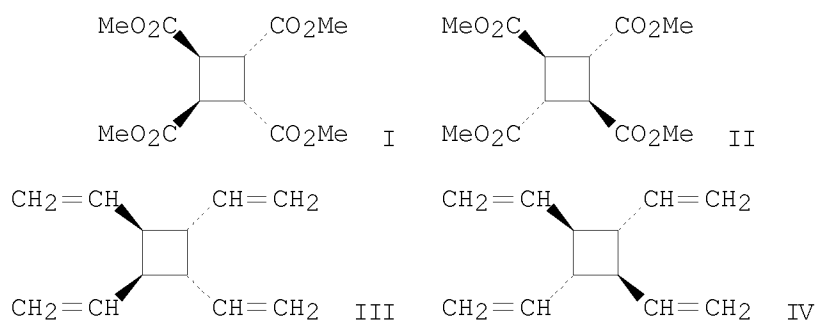
CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



L5 ANSWER 13 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1983:594460 CAPLUS  
DOCUMENT NUMBER: 99:194460  
ORIGINAL REFERENCE NO.: 99:29923a,29926a  
TITLE: cis,trans,cis- and trans,trans,trans-1,2,3,4-Tetravinylcyclobutane - preparation and some spectroscopic properties  
AUTHOR(S): Gleiter, Rolf; Haider, Rudolf; Gubernator, Klaus; Bischof, Peter  
CORPORATE SOURCE: Org. Chem. Inst., Univ. Heidelberg, Heidelberg, D-6900, Fed. Rep. Ger.  
SOURCE: Chemische Berichte (1983), 116(8), 2983-93  
CODEN: CHBEAM; ISSN: 0009-2940  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
OTHER SOURCE(S): CASREACT 99:194460  
GI



AB Photochem. cyclization of di-Me fumarate gave I, which with NaOMe gave II. These were converted by standard means into the tetrakis(bromoethyl) derivs., dehydrohalogenation of which gave III and IV, resp., the photoelectron spectra of which showed strong interaction between the vinyl groups and the ring, but little interaction between the vinyl groups.

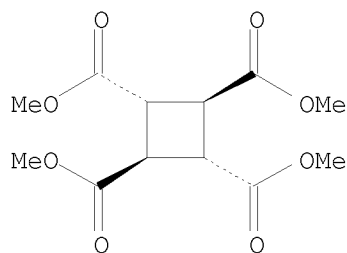
IT 3999-67-5P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(preparation and hydride reduction of)

RN 3999-67-5 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
(1 $\alpha$ ,2 $\beta$ ,3 $\alpha$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.



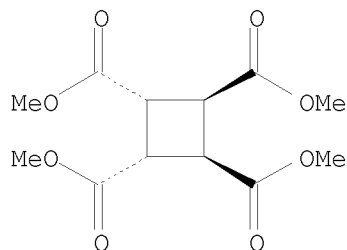
IT 1032-95-7P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(preparation, isomerization, and hydride reduction of)

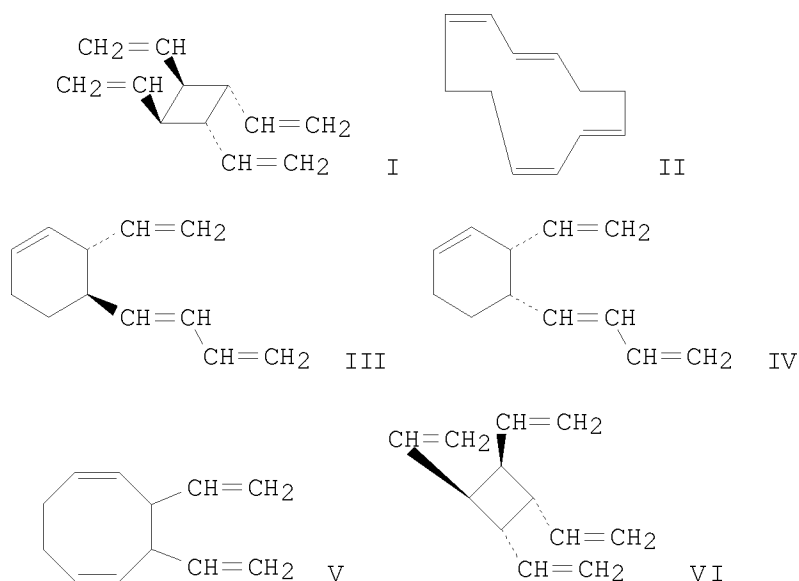
RN 1032-95-7 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



ACCESSION NUMBER: 1982:526711 CAPLUS  
 DOCUMENT NUMBER: 97:126711  
 ORIGINAL REFERENCE NO.: 97:21025a, 21028a  
 TITLE: From cis,trans,cis-1,2,3,4-tetravinylcyclobutane to cyclododecatetraene - two consecutive Cope rearrangements  
 AUTHOR(S): Gubernator, Klaus; Gleiter, Rolf  
 CORPORATE SOURCE: Org.-Chem. Inst., Univ. Heidelberg, Heidelberg, D-6900, Fed. Rep. Ger.  
 SOURCE: Angewandte Chemie (1982), 94(9), 710-11  
 CODEN: ANCEAD; ISSN: 0044-8249  
 DOCUMENT TYPE: Journal  
 LANGUAGE: German  
 OTHER SOURCE(S): CASREACT 97:126711  
 GI



AB I was prepared in a multistep synthesis from trans-MeO<sub>2</sub>CCH:CHCO<sub>2</sub>Me. I at 120° isomerizes almost quant. to a 63:23:14 II (and its cis-trans isomer)-III-IV mixture; the product ratio was temperature and medium independent.

The reaction involves the Cope rearrangement of I to the common intermediate V via VI; V is unstable at these temps. and undergoes a second Cope rearrangement to give II or a 1,3-H shift to give III and IV. The products and I were characterized by <sup>13</sup>C and <sup>1</sup>H NMR.

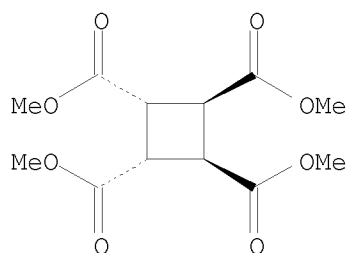
IT 1032-95-7

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (hydride reduction of)

RN 1032-95-7 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



L5 ANSWER 15 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1972:500953 CAPLUS

DOCUMENT NUMBER: 77:100953

ORIGINAL REFERENCE NO.: 77:16639a,16642a

TITLE: Photodehydrocyclizations in stilbenelike compounds.

V. Photochemistry of 2,2'-distyrylbiphenyl

AUTHOR(S): Laarhoven, W. H.; Cuppen, Th. J. H. M.

CORPORATE SOURCE: Dep. Org. Chem., R. C. Univ., Nijmegen, Neth.

SOURCE: Journal of the Chemical Society, Perkin Transactions

1: Organic and Bio-Organic Chemistry (1972-1999)

(1972), (16), 2074-9

CODEN: JCPRB4; ISSN: 0300-922X

DOCUMENT TYPE: Journal

LANGUAGE: English

GI For diagram(s), see printed CA Issue.

AB Irradiation of 2,2'-distyrylbiphenyl (I) in hexane under N for .apprx.15 min gave the kinetically-controlled product trans,trans,trans-1,2,2a,10b-tetrahydro-1,2-diphenylcyclobuta[1]phenanthrene (II) but irradiation, for 6 hr gave 4,5,9,10-tetrahydro-4,9-diphenylphrene (III). Irradiation of I under N in the presence of iodine gave (-phenylbenzo[c]chrysene (IV). I in an evacuated tube at 240-50° for 2 hr gave, cis,cis,cis-1,2,2a,10b-tetrahydro-1,2-diphenylcyclobuta[1]phenanthrene (V). On irradiation or heating II reverted to I but V decomposed to cis-stilbene and phenanthrene.

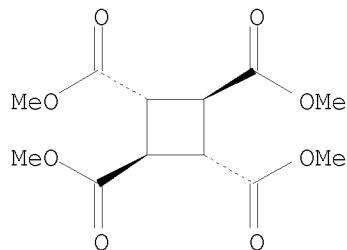
IT 3999-67-5P 31351-41-4P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of)

RN 3999-67-5 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
(1α,2β,3α,4β)- (9CI) (CA INDEX NAME)

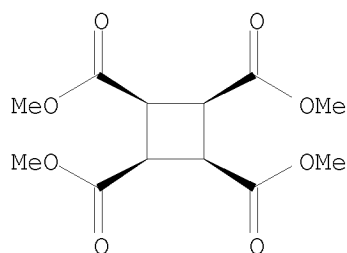
Relative stereochemistry.



RN 31351-41-4 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
(1α,2α,3α,4α)- (9CI) (CA INDEX NAME)

Relative stereochemistry.



L5 ANSWER 16 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1972:24393 CAPLUS

DOCUMENT NUMBER: 76:24393

ORIGINAL REFERENCE NO.: 76:3967a,3970a

TITLE: Photochemical cycloaddition reactions. II.  
Dimerization and cycloadduct formation of some  
seven-membered carbocycles

AUTHOR(S): Kopecky, J.; Shields, J. E.

CORPORATE SOURCE: Ustav Prum. Hyg., Prague, Czech.

SOURCE: Collection of Czechoslovak Chemical Communications  
(1971), 36(10), 3517-26  
CODEN: CCCCAK; ISSN: 0010-0765

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 76:24393

AB The photochem. behavior of 2,3,6,7-dibenzocycloheptatrien-1-one (I),  
2,3,6,7-dibenzocycloheptatriene and  
1-methylene-2,3,6,7-dibenzocycloheptatriene (II), individually and in the  
presence of each other, was studied. Irradiation of solns. of these  
substances gave anti cyclobutane dimers and adducts; reactions occurred  
exclusively at the endocyclic olefinic sites in I and II. This observed  
photospecificity is supported by MO calcns. of delocalization energies for  
the possible reactive sites in the monomers. The elucidation of  
structures, thermal decomposition, chemical interconversions, and  
stereochemistry  
of the photoproducts are described.

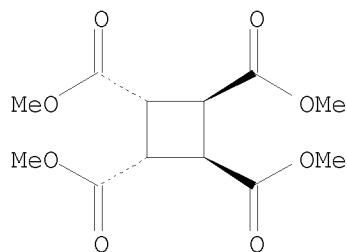
IT 1032-95-7P 31351-41-4P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of)

RN 1032-95-7 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

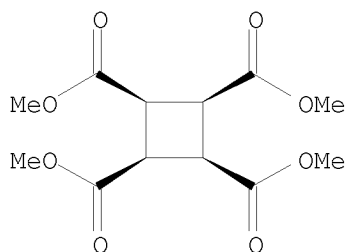
Relative stereochemistry.



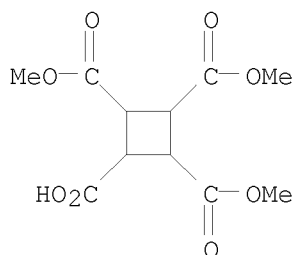
RN 31351-41-4 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\alpha$ ,4 $\alpha$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.



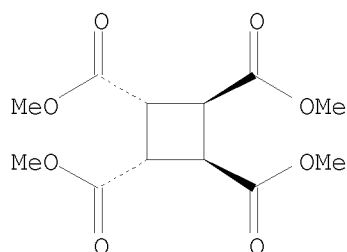
L5 ANSWER 17 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 1971:488002 CAPLUS  
 DOCUMENT NUMBER: 75:88002  
 ORIGINAL REFERENCE NO.: 75:13929a,13932a  
 TITLE: Topochemistry. XXXI. Formation of 1,5-cis,cis-cyclooctadienes from 1,4-disubstituted s-trans-butadienes in the solid state. C4- versus C8-cyclodimerization  
 AUTHOR(S): Schmidt, G. M. J.; Green, B. S.; Lahav, M.  
 CORPORATE SOURCE: Dep. Chem., Weizmann Inst. Sci., Rehovot, Israel  
 SOURCE: Journal of the Chemical Society [Section] B: Physical Organic (1971), (8), 1552-64  
 CODEN: JCSPAC; ISSN: 0045-6470  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB Solid MeCH:CHCH:CHCO<sub>2</sub>H (I), MeCH:CHCH:CHCONH<sub>2</sub> (II), NCCH:CHCH:CHCN (III), PhCH:CHCH:CHCO<sub>2</sub>H (IV), PhCH:CHCH:CHCO<sub>2</sub>Me, and PhCH:CHCH:CHCONH<sub>2</sub> (V) (all with trans,trans-configuration) dimerized on irradiation ( $\lambda > 290$  nm) to divinylcyclobutane derivs. The structures of the fully characterized photoproducts from I, II, III, and V and the light-stability of PhCH:CHCH:CHCONHPh were predictable from the known or postulated packing arrangements of their monomers. trans-1,trans-15-Cyclooctadienes, although topochem. and symmetry-allowed from monomers which crystallize with parallel butadiene chains (I, II, III, and possibly IV), were not observed. The (all-axial)-cis-1,cis-5-cyclooctadiene derivs. formed during irradiation of I, II, and IV were not primary photoproducts but arose from thermal Cope rearrangements of photochem.-produced cis-1,2-divinylcyclobutanes.  
 IT 34271-90-4P  
 RL: SPN (Synthetic preparation); PREP (Preparation) (preparation of)  
 RN 34271-90-4 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, trimethyl ester, stereoisomer (8CI) (CA INDEX NAME)



L5 ANSWER 18 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 1971:411703 CAPLUS

DOCUMENT NUMBER: 75:11703  
ORIGINAL REFERENCE NO.: 75:1873a,1876a  
TITLE: Structure of a planar cyclobutane.  
Cis,trans,cis-1,2,3,4-cyclobutanetetracarboxylic acid  
tetramethyl ester  
AUTHOR(S): Margulis, Thomas N.  
CORPORATE SOURCE: Dep. Chem., Univ. Massachusetts, Boston, MA, USA  
SOURCE: Journal of the American Chemical Society (1971),  
93(9), 2193-5  
CODEN: JACSAT; ISSN: 0002-7863  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB A single-crystal x-ray diffraction study of the title compound shows the  
cyclobutane ring to be planar with C-C bond lengths of  $1.572 \pm 0.005$   
and  $1.541 \pm 0.004$  Å. The crystals are triclinic, space group P ,  
with  $a = 8.939$ ,  $b = 5.963$ , and  $c = 6.454$  Å;  $\alpha = 95.17$ ,  $\beta =$   
 $81.43$ ,  $\gamma = 78.74^\circ$ ;  $Z = 1$  and calculated  $d. = 1.45$ . The structure  
was refined to an R value of 0.035 for 833 independent reflections.  
IT 1032-95-7  
RL: PRP (Properties)  
(crystal structure of)  
RN 1032-95-7 CAPLUS  
CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

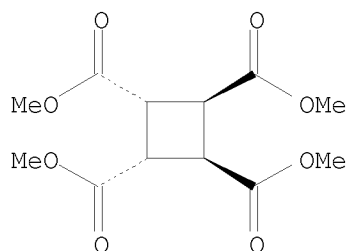
Relative stereochemistry.



L5 ANSWER 19 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN  
ACCESSION NUMBER: 1971:75813 CAPLUS  
DOCUMENT NUMBER: 74:75813  
ORIGINAL REFERENCE NO.: 74:12299a,12302a  
TITLE: Photochemistry of  $\alpha,\beta$ -unsaturated  
 $\gamma$ -lactones. I. Structures of the photodimers  
of 4-hydroxycrotonic acid  $\gamma$ -lactone  
AUTHOR(S): Ohga, Kazuya; Matsuo, Taku  
CORPORATE SOURCE: Fac. Eng., Kyushu Univ., Fukuoka, Japan  
SOURCE: Bulletin of the Chemical Society of Japan (1970),  
43(11), 3505-10  
CODEN: BCSJA8; ISSN: 0009-2673  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
GI For diagram(s), see printed CA Issue.  
AB The structures of the photodimers obtained from 4-hydroxycrotonic acid  
 $\gamma$ -lactone under several conditions were determined. The products of  
irradiations in the solution were a pair of anti dimers: one is a head-to-head  
cycloadduct (I) and the other a head-to-tail adduct (II). The  
corresponding product in the solid state, on the other hand, was a  
head-to-head cycloadduct (III), in the syn form.  
IT 1032-95-7P 31351-41-4P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of)

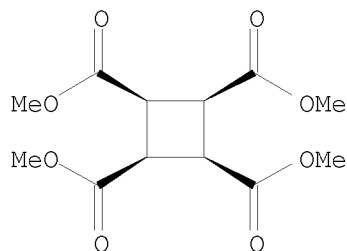
RN 1032-95-7 CAPLUS  
CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



RN 31351-41-4 CAPLUS  
CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\alpha$ ,4 $\alpha$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.



L5 ANSWER 20 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1970:487884 CAPLUS

DOCUMENT NUMBER: 73:87884

ORIGINAL REFERENCE NO.: 73:14365a,14368a

TITLE: Effect of radiation on stable nucleic acid. 19.  
Synthesis of the cis/syn- and cis/anti-dimeric uracils

AUTHOR(S): Richter, Peter; Fahr, Egon

CORPORATE SOURCE: Inst. Org. Chem., Univ. Wuerzburg, Wuerzburg, Fed.  
Rep. Ger.

SOURCE: Tetrahedron Letters (1970), (22), 1921-3

CODEN: TELEAY; ISSN: 0040-4039

DOCUMENT TYPE: Journal

LANGUAGE: German

GI For diagram(s), see printed CA Issue.

AB The cis/anti- and cis/syn-dimeric uracils (I) and (II), resp., were prepared  
Thus, refluxing III in MeOH gave IV (R = OH) and V (R = OH). IV (R = OH)  
was heated in CHCl<sub>3</sub> with PCl<sub>5</sub> to give IV (R = Cl) which was treated with  
NaN<sub>3</sub> in CHCl<sub>3</sub> to give IV (R = N<sub>3</sub>). Refluxing IV (R = N<sub>3</sub>) in PhMe under N  
gave VI (R = NCO) which was converted to VI (R = NHCONH<sub>2</sub>) by NH<sub>3</sub> in CHCl<sub>3</sub>.  
I (4%) and uracil were prepared by heating VI (R = NHCONH<sub>2</sub>) with 2N HCl at  
65-70°. The ir spectrum of I was identical with that of the  
product of uv irradiation of uracil. II was similarly prepared from V (R =  
OH).

IT 28972-38-5P

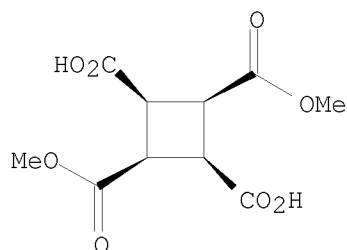
RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of)

RN 28972-38-5 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,3-dimethyl ester,

cis-1,2,cis-1,3,cis-1,4- (8CI) (CA INDEX NAME)

Relative stereochemistry.



L5 ANSWER 21 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1970:132351 CAPLUS

DOCUMENT NUMBER: 72:132351

ORIGINAL REFERENCE NO.: 72:23687a,23690a

TITLE: Preparation and properties of some 1,1'-diphenyl-syn, trans-truxane[9,10-diphenyl-syn, trans-4b,4c,9,9z,9b,10-hexahydrocyclobuta[1,2-a:4,3-a]diindene]derivatives

AUTHOR(S): Setliff, Frank L.

CORPORATE SOURCE: Univ. of Arkansas, Little Rock, AR, USA

SOURCE: Proceedings of the Arkansas Academy of Science (1969), 23, 177-82

CODEN: AKASAO; ISSN: 0097-4374

DOCUMENT TYPE: Journal

LANGUAGE: English

AB exo,exo-1,1'-Dibromo-syn,trans-truxane (I) was treated with PhMgBr in the presence of CoCl<sub>2</sub> in ether-benzene to yield 51% exo,exo-1,1'-diphenyl-syn,trans-truxane (II), m. 205-6° (methylcyclohexane). II was also prepared (in 20% yield) by the alkylation of C<sub>6</sub>H<sub>6</sub> with I in the presence of AlCl<sub>3</sub> (12 hr at room temperature and 1 hr at 50°). Longer reaction times or higher temps. cause the disappearance of II and give 30% exo,endo-1,1'-diphenyl-syn,trans-truxane (III), m. 147-9°. II isomerizes to III (37% yield) with excess AlCl<sub>3</sub> in C<sub>6</sub>H<sub>6</sub> with gaseous HCl. The exo,exo isomer was assumed to be the more stable; two sequences are offered to explain the II → III isomerization. Degradative ozonolysis of II and III in AcOH at room temperature, followed by esterification of the acid product with CH<sub>2</sub>N<sub>2</sub> give cis,trans-1,2, 3,4-tetracarboxymethoxy-cyclobutane.

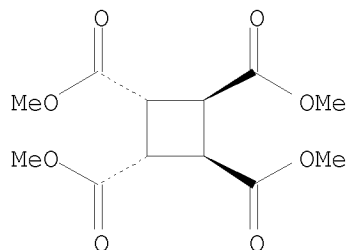
IT 1032-95-7P

RL: SPN (Synthetic preparation); PREP (Preparation) (preparation of)

RN 1032-95-7 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

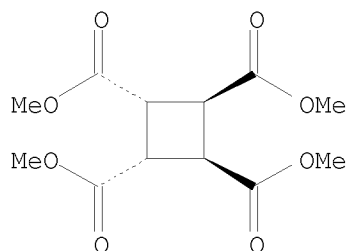
Relative stereochemistry.



L5 ANSWER 22 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1970:42919 CAPLUS  
DOCUMENT NUMBER: 72:42919  
ORIGINAL REFERENCE NO.: 72:7855a,7858a  
TITLE: Cyclobutanes. XXIV. Rearrangement of the  
tricyclo[4.2.0.02.5]octane system into the  
tricyclo[4.2.0.02.4]octane system  
AUTHOR(S): Avram, Margareta; Mateescu, Gheorghe D.; Dinulescu,  
Ilie G.; Nenitzescu, Costin D.  
CORPORATE SOURCE: Org.-Chem. Inst., Akad. R.S.R., Bucharest, Rom.  
SOURCE: Chemische Berichte (1969), 102(12), 4008-16  
CODEN: CHBEAM; ISSN: 0009-2940  
DOCUMENT TYPE: Journal  
LANGUAGE: German  
GI For diagram(s), see printed CA Issue.  
AB Addition of Br to anti-tricyclo[4.2.0.02,5]octa-3,7-diene yielded two  
3,4,7,8-tetrabromo-anti-tricyclo[4.2.0.02,5]octanes (I and II) which  
showed cis-trans isomerism of the Br atoms 7 and 8. I and II gave upon  
base treatment 3,7(or 3,8)-dibromo-anti-tricyclo[4.2.0.02,5]octa-3,7-  
diene. I and II gave upon heating the corresponding  
3,5,7,8-tetrabromo-anti-tricyclo[4.2.0.02,4]octanes (III and IV, resp.).  
IT 1032-95-7P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of)  
RN 1032-95-7 CAPLUS  
CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



L5 ANSWER 23 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1969:469903 CAPLUS  
DOCUMENT NUMBER: 71:69903  
ORIGINAL REFERENCE NO.: 71:12881a,12884a  
TITLE: Photolytic transformations of  
cis,cis-cyclodeca-3,8-diene-1,6-dione  
AUTHOR(S): Stankorb, Jerry W.; Conrow, Kenneth  
CORPORATE SOURCE: Kansas State Univ., Manhattan, KS, USA  
SOURCE: Tetrahedron Letters (1969), (28), 2395-8  
CODEN: TELEAY; ISSN: 0040-4039  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
GI For diagram(s), see printed CA Issue.  
AB Irradiation of cis,cis-cyclodeca-3,8-diene-1,6-dione (I) in Me<sub>2</sub>CO 2.5 hrs.  
gave 4 products including 60% tricyclic diketone (II, R = H<sub>2</sub>) (IIa). IIa  
refluxed in EtOH with BzH and a catalytic amount of piperidine yielded 85%  
tetrabenzylidene derivative (II, R = PhCH) (IIb), m. 211-12°. Ozonolysis of IIb,  
followed by oxidative work-up and esterification with CH<sub>2</sub>N<sub>2</sub> yielded 33% tetramethyl  
1,2,3,4-cyclobutanetetracarboxylate (III), m. 147°. The tricyclo[4.4.0.02,7]  
isomer (IV) could only give the

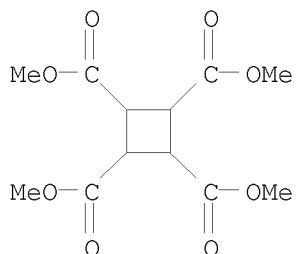
trans,trans,trans-tetracarboxylate. The tricyclic diketone (V) was converted to the dibenzylidene derivative (VI, R = O), m. 269°, in 87% yield, reduced by 1:2 LiAlH<sub>4</sub>-AlCl<sub>3</sub> to 3,8-dibenzylidenetricyclo[5.3.0.0<sup>2,6</sup>]decane (VI, R = H) (VII), m. 123-4°, in 22% yield. Oxidation of VII with NaIO<sub>4</sub>-KMnO<sub>4</sub> in aqueous dioxane gave 44.4% IIa. Baeyer-Villiger oxidation of the tricyclic diketone gave only 1 dilactone, m. 211-12°, presumably arising from IIa and not from the isomer IV which should produce 2 lactones. IIa was identical with the supposed cis, syn, cis-tricyclo[5.3.0.0<sup>2,6</sup>]decane-4,9-dione of Shani (1968) by trans-ketalization with MeC(OMe)<sub>2</sub>Me and p-MeC<sub>6</sub>H<sub>4</sub>SO<sub>3</sub>H to give the reported diketal. IIa gave an oxime, m. 255-8°. IIa and a molar equivalent of N<sub>2</sub>H<sub>4</sub>.H<sub>2</sub>O gave a high yield of an azine (VIII), m. 295° (decomposition),  $\nu$  3320, 1740, 1655 cm.<sup>-1</sup>, indicating residual CO groups and terminal NH<sub>2</sub>. VIII was accordingly formulated as a linear polymer with CO and hydrazone end groups. Upon electron impact or thermal decomposition retrocyclization in the 4-membered ring gives fragments (IX,X) of various sizes accounting for the mass spectrum, m/e 160, 242, 320, 402, 480, 562. Evidently I undergoes cis-trans isomerization either prior to, or concerted with, photocyclization. IIa is obtained from I even under conditions where no photosensitization may be expected. Under these conditions n- $\pi^*$  excitation and intersystem crossing to a triplet state is followed by intramol. energy transfer to one of the double bond  $\pi$  systems. Isomerization and cyclization may then ensue in this or subsequent excited states.

IT 14495-41-1P

RL: SPN (Synthetic preparation); PRP (Properties); PREP (Preparation)  
(Photolytic transformations of cis,cis-cyclodeca-3,8-diene-1,6-dione)

RN 14495-41-1 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



L5 ANSWER 24 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1969:106459 CAPLUS

DOCUMENT NUMBER: 70:106459

ORIGINAL REFERENCE NO.: 70:19879a,19882a

TITLE: Action of radiation on nucleic acid components. XVI.  
Synthesis of trans/syn- trans/anti-dimeric uracil

AUTHOR(S): Richter, P.; Fahr, Egon

CORPORATE SOURCE: Univ. Wuerzburg, Wuerzburg, Fed. Rep. Ger.

SOURCE: Angewandte Chemie, International Edition in English  
(1969), 8(3), 208-9

CODEN: ACIEAY; ISSN: 0570-0833

DOCUMENT TYPE: Journal

LANGUAGE: English

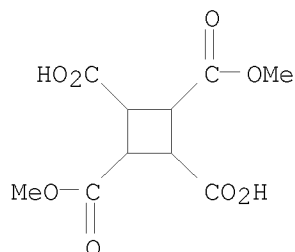
AB trans-1,2,3,4-Cyclobutanetetracarboxylic acid dianhydride is converted to trans-1,2-bis(3-methylureido)-trans-3,4-cyclobutanedi-carboxylic acid di-Me ester (I); the trans-1,3-trans-2,3-isomer (II) of I is prepared from a di-Me trans-1,3-cyclobutanedicarboxylate. I and II are heated with 2N HCl to give the title dimers.

IT 22555-07-3P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of)

RN 22555-07-3 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,3-dimethyl ester,  
cis-2,trans-3,trans-4- (8CI) (CA INDEX NAME)



L5 ANSWER 25 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1967:28305 CAPLUS

DOCUMENT NUMBER: 66:28305

ORIGINAL REFERENCE NO.: 66:5335a,5338a

TITLE: Maleic anhydride-hexamethylbenzene mixtures in  
methylcyclohexane solution and in the solid state.  
II. Photochemical and thermal reactions

AUTHOR(S): Raciszewski, Zbigniew

CORPORATE SOURCE: Union Carbide Corp., South Charleston, WV, USA

SOURCE: Journal of the Chemical Society [Section] B: Physical  
Organic (1966), (12), 1147-55  
CODEN: JCSPAC; ISSN: 0045-6470

DOCUMENT TYPE: Journal

LANGUAGE: English

GI For diagram(s), see printed CA Issue.

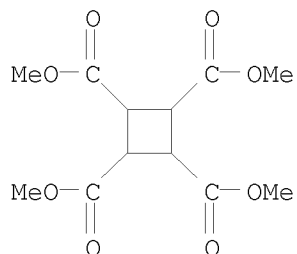
AB cf. preceding abstract A methylcyclohexane solution of maleic anhydride and hexamethylbenzene was irradiated with uv light in the absence and in the presence of filters that confined absorption, either nearly or completely, to the maleic anhydride-hexamethylbenzene charge-transfer complex. In the latter case the reaction mixture also contained toluene in a 6- and 25-fold molar excess over hexamethylbenzene. Pentamethylbenzylsuccinic anhydride and resinous substances were isolated in all expts. but no adducts of toluene with maleic anhydride were found. Evidence was obtained for formation of CO<sub>2</sub> during the irradiation. Uv irradiation of a mixture of maleic anhydride and hexamethylbenzene in the solid state produced 1,2,3,4-cyclobutanetetracarboxylic acid dianhydride (I). No adducts of hexamethylbenzene with maleic anhydride were detected. From a partly carbonized mixture obtained by heating equimolar quantities of maleic anhydride and hexamethylbenzene to 250° for 15.5 hrs. and followed by hydrolysis were isolated pentamethylbenzylsuccinic acid, 4,5,6,7-tetramethylindan-1,2-dicarboxylic acid, and resinous materials. Only 4,5,6,7-tetramethylindan-1,2-dicarboxylic acid and the resins were isolated in a similar experiment but with the heating time extended to 17 hrs. No detectable reaction occurred at 200° over a period of 14 hrs. Large contribution of the dative structure to the electronically excited complex (about 90%) resulted in the proton transfer within the complex to give a geminate pair of free radicals that combined yielding pentamethylbenzylsuccinic anhydride. The course of the photochem. reaction in the solid state reflected the absence of the charge-transfer complex and the limited mobility of the components of the solid matrix. Crystalline products obtained in the thermal reactions probably originated from the addition of the pentamethylbenzyl radical, formed by cleavage of the benzylic C-H bond in hexamethylbenzene, to maleic anhydride.

IT 14495-41-1P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of)

RN 14495-41-1 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA  
INDEX NAME)



L5 ANSWER 26 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1967:28280 CAPLUS

DOCUMENT NUMBER: 66:28280

ORIGINAL REFERENCE NO.: 66:5327a,5330a

TITLE: Configuration analysis of cyclobutane by N.M.R.  
spectroscopy

AUTHOR(S): Weitkamp, Horst; Korte, Friedhelm

CORPORATE SOURCE: Univ. Bonn, Bonn, Germany

SOURCE: Tetrahedron, Supplement (1966), No. 7, 75-87

CODEN: TETSAE; ISSN: 0563-2072

DOCUMENT TYPE: Journal

LANGUAGE: German

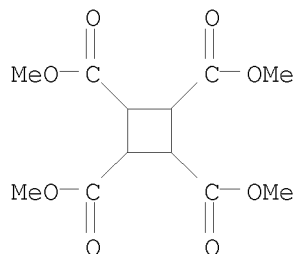
AB A detailed analysis of 20 cyclobutanes is given. The magnetic shielding parameters are between  $\tau = 6.2$  and  $8.2$  ppm. depending on the substituents. The effects of the substituents on the shift values for the ring protons were calculated. The geminal and vicinal spin-spin coupling constant have the same size. The geminal coupling constant is opposite in sign to the vicinal ones, and, from theoretical considerations, assumed to be neg. The differences between the cis- and trans-vicinal coupling consts. are often very small, though the ratio  $J_{cis}/J_{trans}$  is always larger than 1. The magnitudes are  $-11$  to  $-14$  cycles/sec. for the geminal,  $+8$  to  $+12$  cycles/sec. for the cis-vicinal, and  $+8$  to  $+10$  cycles/sec. for the transvicinal coupling consts.

IT 14495-41-1

RL: PRP (Properties)  
(configuration and N.M.R. of)

RN 14495-41-1 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA  
INDEX NAME)



L5 ANSWER 27 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

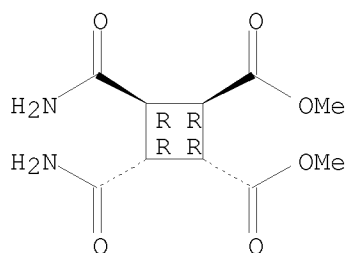
GI For diagram(s), see printed CA Issue.  
AB cf. CA 65, 949h. Tetra-Et trans-cyclobutane tetracarboxylate, prepared by photochem. dimerization of trans-HO<sub>2</sub>CCH:CHCO<sub>2</sub>H, saponified and treated with Ac<sub>2</sub>O gave the anhydride (I), m. 300°. I heated in NH<sub>4</sub>OH gave the amido-carboxylic acids (II, R = CONH<sub>2</sub>), C<sub>8</sub>H<sub>10</sub>N<sub>2</sub>O<sub>6</sub>, m. >300° (di-Me ester, m. >300°, prepared by methylation with CH<sub>2</sub>N<sub>2</sub>). The product was chromatog. unique but on submission to Hofmann degradation gave a very hygroscopic mixture of diaminocyclobutane dicarboxylic acids II (R = NH<sub>2</sub>) (III); tolylsulfonate m. 226-8°. II reacted with KCN gave the mixture (IV). IV was less thermally stable than the photochem. prepared cis-(5,5/6,6)dimeric uracil (V) and could not be recrystd. from H<sub>2</sub>O. Irradiation with shortwave uv light transformed IV into uracil. Paper chromatog. (7:3 PrOH-H<sub>2</sub>O) of IV and V gave the same R<sub>f</sub> value but thin-layer chromatog. on silica gel (7:3 PrOH-H<sub>2</sub>O) gave R<sub>f</sub> 0.50-0.53 for the photochem. prepared dimer V and R<sub>f</sub> 0.60-0.63 for the synthetic dimer IV. Alkaline degradation 60 h. in 10 N aqueous NaOH at 50° reconverted IV to III, identified by the tolylsulfonate. The purely chemical synthesis of trans dimeric uracils demonstrated the presence of a cyclobutene system and showed to what extent the trans linkage of the pyrimidine rings in contrast to the cis dimerization by photochem. means, altered the properties of the dimer.

IT 13375-96-7 13375-97-8 13375-98-9  
(Derived from data in the 7th Collective Formula Index (1962-1966))

RN 13375-96-7 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-dicarbamoyl-,  
cis-1,2,trans-1,3,trans-1,4- (8CI) (CA INDEX NAME)

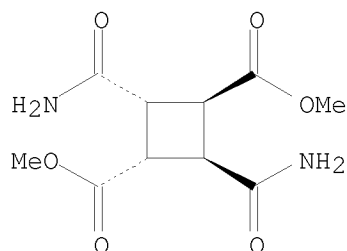
Relative stereochemistry.



RN 13375-98-9 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-dicarbamoyl-, dimethyl ester,  
cis-1,2,trans-1,3,trans-1,4- (8CI) (CA INDEX NAME)

Relative stereochemistry.



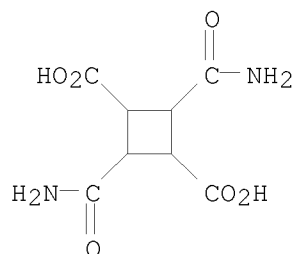
IT 90007-87-7P, 1,3-Cyclobutanedicarboxylic acid, 2,4-dicarbamoyl-  
91059-88-0P, 1,2-Cyclobutanedicarboxylic acid, 3,4-dicarbamoyl-,  
dimethyl ester 91059-89-1P, 1,3-Cyclobutanedicarboxylic acid,  
2,4-dicarbamoyl-, dimethyl ester

RL: PREP (Preparation)

(preparation of)

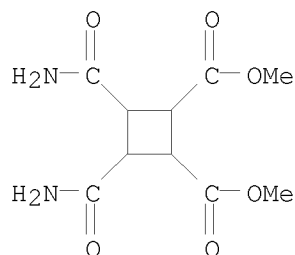
RN 90007-87-7 CAPLUS

CN 1,3-Cyclobutanedicarboxylic acid, 2,4-bis(aminocarbonyl)- (CA INDEX NAME)

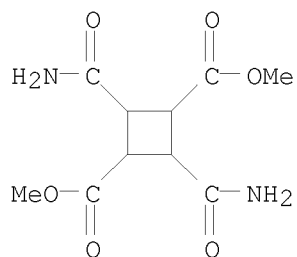


RN 91059-88-0 CAPLUS

CN 1,2-Cyclobutanedicarboxylic acid, 3,4-bis(aminocarbonyl)-, 1,2-dimethyl  
ester (CA INDEX NAME)

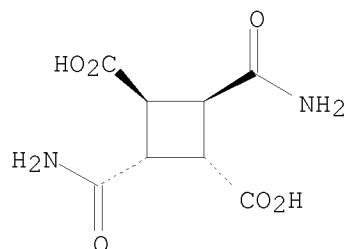


RN 91059-89-1 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-dicarbamoyl-, dimethyl ester (7CI)  
 (CA INDEX NAME)



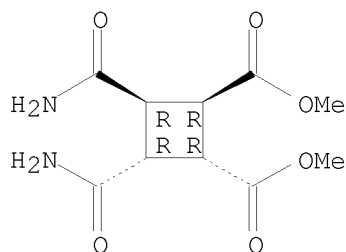
L5 ANSWER 28 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 1966:507416 CAPLUS  
 DOCUMENT NUMBER: 65:107416  
 ORIGINAL REFERENCE NO.: 65:19967g-h  
 TITLE: Diazo compounds. XXV. Kinetic studies of the photolysis and of the thermal decomposition of diazomethane in cyclohexane and cyclohexene  
 AUTHOR(S): Mueller, Eugen; Renner, R.; Rundel, W.  
 CORPORATE SOURCE: Univ. Tuebingen, Germany  
 SOURCE: Zeitschrift fuer Naturforschung, Teil B: Anorganische Chemie, Organische Chemie, Biochemie, Biophysik, Biologie (1966), 21(8), 751-5  
 CODEN: ZENBAX; ISSN: 0044-3174  
 DOCUMENT TYPE: Journal  
 LANGUAGE: German  
 AB cf. CA 64, 19512e. The kinetics of the photolysis of diazomethane (I) in cyclohexane, mixts. of cyclohexane-cyclohexene (molar ratio 25:1), and cyclohexene are identical, indicating a similar mechanism, probably a carben mechanism; the presence of O accelerates the photolysis of I in cyclohexane by a factor of 6. The thermal decompn, of I in the dark in cyclohexane is a 1st order reaction with a half life period of 74 hrs. at 25°.  
 IT 13375-96-7 13375-97-8 13375-98-9  
 (Derived from data in the 7th Collective Formula Index (1962-1966))  
 RN 13375-96-7 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-dicarbamoyl-, cis-1,2,trans-1,3,trans-1,4- (8CI) (CA INDEX NAME)

Relative stereochemistry.



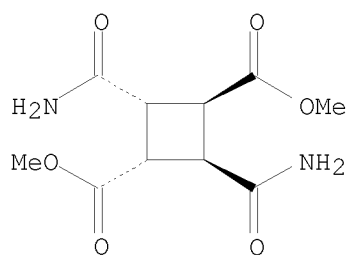
RN 13375-97-8 CAPLUS  
 CN 1,2-Cyclobutanedicarboxylic acid, 3,4-dicarbamoyl-, dimethyl ester, trans-1,2,trans-1,3,cis-1,4- (8CI) (CA INDEX NAME)

Relative stereochemistry.



RN 13375-98-9 CAPLUS  
 CN 1,3-Cyclobutanedicarboxylic acid, 2,4-dicarbamoyl-, dimethyl ester,  
 cis-1,2,trans-1,3,trans-1,4- (8CI) (CA INDEX NAME)

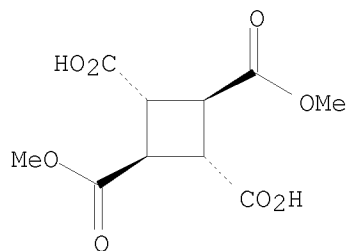
Relative stereochemistry.



L5 ANSWER 29 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 1966:472656 CAPLUS  
 DOCUMENT NUMBER: 65:72656  
 ORIGINAL REFERENCE NO.: 65:13490a-d  
 TITLE: Photochemistry of crystalline dimethyl  
 all-trans-hexatriene-1,6-decarboxylate  
 AUTHOR(S): Lahav, M.; Schmidt, G. M. J.  
 CORPORATE SOURCE: Weizmann Inst. Sci., Rehovoth, Israel  
 SOURCE: Tetrahedron Letters (1966), (26), 2957-62  
 CODEN: TELEAY; ISSN: 0040-4039  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 GI For diagram(s), see printed CA Issue.  
 AB Di-Me all-trans-hexatriene-1,6-dicarb oxylate, I, m. 172° (alc.),  
 irradiated under Pyrex glass 6 days in sunlight ( $\lambda > 290 \text{ m}\mu$ ) and  
 the mixed product chromatographed from a min. amount of  $\text{CHCl}_3$  on silica gel,  
 eluted with  $\text{C}_6\text{H}_6$  to remove I and again with 9:1  $\text{C}_6\text{H}_6\text{-CHCl}_3$  gave 22% di-Me  
 trans-1,3-bis[4-(1-carbomethoxy)buta-1-trans,3-trans-dienyl]cyclobutane-  
 2,4-dicarboxylate (II), m. 139-40°. II submitted to ozonolysis in  
 $\text{AcOH}$  2 hrs. and the mixture treated with 20%  $\text{H}_2\text{O}_2$  gave  
 trans-1,3-dicarbomethoxycyclobutane-trans-2,4-dicarboxylic acid, m.  
 179-80° ( $\text{Me}_2\text{CO}$ ). In the triclinic crystal structure of I, all  
 mols. are likely to be parallel by analogy with the crystal structure of  
 di-Me trans-trans-muconate. Since the unit cell does not have a 4-A. axis  
 the only other sym. dimer to be expected from a topochemically controlled  
 reaction is II. The formation of a cyclodimer from a crystalline hexatriene  
 derivative showed that this solid state reaction occurred with a min. amount of  
 mol. motion since the trans configuration of the triene system was  
 preserved and no other dimers or rearranged monomeric compds. were  
 observed.  
 IT 2957-97-3 13160-90-2  
 (Derived from data in the 7th Collective Formula Index (1962-1966))  
 RN 2957-97-3 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,3-dimethyl ester,  
(1 $\alpha$ ,2 $\beta$ ,3 $\alpha$ ,4 $\beta$ )- (CA INDEX NAME)

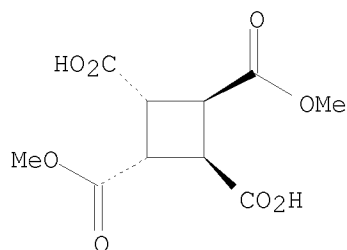
Relative stereochemistry.



RN 13160-90-2 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,3-dimethyl ester,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

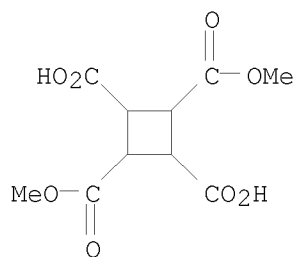
Relative stereochemistry.



IT 22555-07-3P, 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,3-dimethyl  
ester, trans,trans-  
RL: PREP (Preparation)  
(preparation of)

RN 22555-07-3 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,3-dimethyl ester,  
cis-2,trans-3,trans-4- (8CI) (CA INDEX NAME)



L5 ANSWER 30 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1966:472655 CAPLUS

DOCUMENT NUMBER: 65:72655

ORIGINAL REFERENCE NO.: 65:13489h,13490a

TITLE: Vapor phase photochemistry of 1,3-butadiene-1,1,4,4-d4

AUTHOR(S): Haler, I.; Srinivasan, R.

CORPORATE SOURCE: Watson Res. Center, Intern. Business Machines,  
Yorktown Heights, NY

SOURCE: Journal of the American Chemical Society (1966),

88(16), 3694-8

CODEN: JACSAT; ISSN: 0002-7863

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The mechanisms of the 3 primary processes in the vapor phase photolysis of 1,3-butadiene were investigated by the use of D labeling on the end C atoms. None of the processes proceeds by the obvious pathway exclusively. Thus, ethylene and acetylene are formed not only by a 1,3 shift but also via an intermediate cyclobutene and a third path which gives C<sub>2</sub>H<sub>2</sub>D<sub>2</sub> and C<sub>2</sub>D<sub>2</sub>. Two mechanisms seem to be applicable to the other 2 primary processes which give 1,2-butadiene and H<sub>2</sub> + C<sub>4</sub>H<sub>4</sub>, resp.

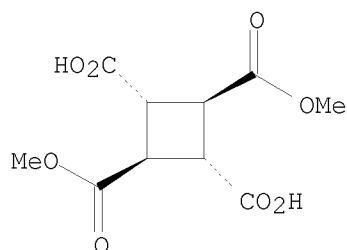
IT 2957-97-3 13160-90-2

(Derived from data in the 7th Collective Formula Index (1962-1966))

RN 2957-97-3 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,3-dimethyl ester,  
(1 $\alpha$ , 2 $\beta$ , 3 $\alpha$ , 4 $\beta$ )- (CA INDEX NAME)

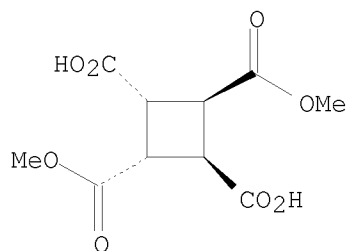
Relative stereochemistry.



RN 13160-90-2 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,3-dimethyl ester,  
(1 $\alpha$ , 2 $\alpha$ , 3 $\beta$ , 4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.



L5 ANSWER 31 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1966:465275 CAPLUS

DOCUMENT NUMBER: 65:65275

ORIGINAL REFERENCE NO.: 65:12123f-g

TITLE: Preparation of oximes using a silver chromate and (or) silver dichromate catalyst

INVENTOR(S): Young, Vernon V.

PATENT ASSIGNEE(S): Commercial Solvents Corp.

SOURCE: 8 pp.

DOCUMENT TYPE: Patent

LANGUAGE: Unavailable

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.

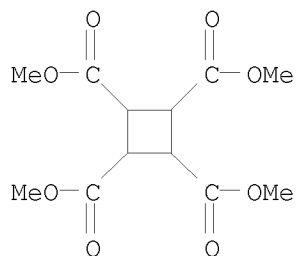
KIND

DATE

APPLICATION NO.

DATE

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	US 3267142	19660816	US 1964-412334	19611218
PRIORITY APPLN. INFO.:			US	19611218
AB	To a suspension of 17 g. AgNO <sub>3</sub> and 21.5 g. ZnO in 400 ml. H <sub>2</sub> O were added solns. of 13 g. (NH <sub>4</sub> ) <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> or 16.2 g. CaCr <sub>2</sub> O <sub>7</sub> or 15 g. Na <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> ·2H <sub>2</sub> O or 15 g. K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> or 10 g. CrO <sub>3</sub> in 200 ml. H <sub>2</sub> O. The solids were filtered off and dried at 100°. Similarly prepared were Ag <sub>2</sub> CrO <sub>4</sub> and Ag <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> on CaCO <sub>3</sub> , Al <sub>2</sub> O <sub>3</sub> , SiO <sub>2</sub> , CaO, CaHPO <sub>4</sub> , Ca <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub> , and TiO <sub>2</sub> . These catalysts were used for the hydrogenation of nitroparaffins in MeOH at 500-1000 psi. and 135°. Several examples are given for the reduction of nitrocyclohexane which led to C <sub>6</sub> H <sub>11</sub> NH <sub>2</sub> , C <sub>6</sub> H <sub>11</sub> NHOH, and C <sub>6</sub> H <sub>10</sub> :NOH. The best yields of oxime were obtained with Ag <sub>2</sub> CrO <sub>4</sub> -CaCO <sub>3</sub> 1:1 (23.8%) and with Ag <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> -ZnO 1:1 (29.3%).			
IT	14495-41-1 (Derived from data in the 7th Collective Formula Index (1962-1966))			
RN	14495-41-1 CAPLUS			
CN	1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)			



L5 ANSWER 32 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1966:465274 CAPLUS

DOCUMENT NUMBER: 65:65274

ORIGINAL REFERENCE NO.: 65:12123f

TITLE: Isomerization of tetramethyl cis, trans, cis-1,2,3,4-cyclobutanetetracarboxylate

INVENTOR(S): Griffin, Gary W.

PATENT ASSIGNEE(S): American Cyanamid Co.

SOURCE: 2 pp.; Division of U.S. 3,139,395 (CA 61, 6937b)

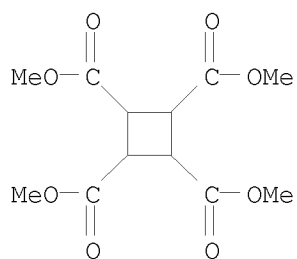
DOCUMENT TYPE: Patent

LANGUAGE: Unavailable

FAMILY ACC. NUM. COUNT: 1

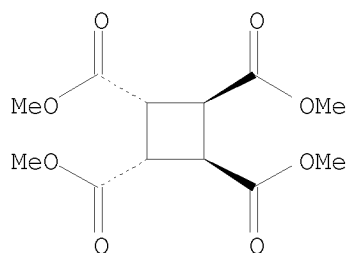
PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	-----
	US 3253016		19660524	US 1964-351519	19640312
PRIORITY APPLN. INFO.:				US	19640312
AB	The disclosure is the same but the claims are different.				
IT	14495-41-1 (Derived from data in the 7th Collective Formula Index (1962-1966))				
RN	14495-41-1 CAPLUS				
CN	1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)				



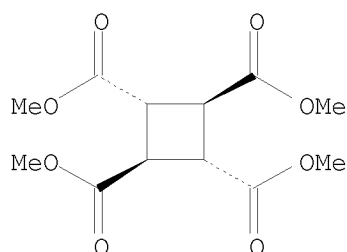
IT 1032-95-7P, 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester, cis, trans, cis- 3999-67-5P,  
 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester, trans, trans, trans-  
 RL: PREP (Preparation)  
 (preparation of)  
 RN 1032-95-7 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



RN 3999-67-5 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
 (1 $\alpha$ ,2 $\beta$ ,3 $\alpha$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

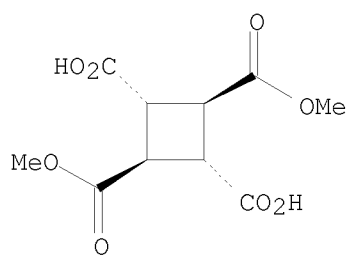
Relative stereochemistry.



L5 ANSWER 33 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 1966:438196 CAPLUS  
 DOCUMENT NUMBER: 65:38196  
 ORIGINAL REFERENCE NO.: 65:7072h,7073a  
 TITLE: Electrolytic oxidation of cyclobutane-1,3-dicarboxylic acids. An electrochemical synthesis of 2,4-dicarbomethoxybicyclobutane  
 AUTHOR(S): Vellturo, Anthony F.; Griffin, Gary W.  
 CORPORATE SOURCE: Tulane Univ., New Orleans, LA  
 SOURCE: Journal of Organic Chemistry (1966), 31(7), 2241-4  
 CODEN: JOCEAH; ISSN: 0022-3263

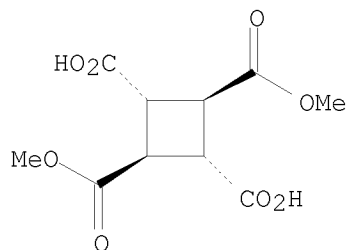
DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB Anodic oxidation of trans,trans,trans-1,3-dicarboxy-2,4-dicarbomethoxycyclobutane in the Kolbe manner gives 2,4-dicarbomethoxybicyclobutane. In contrast, electrolysis of  $\alpha$ -truxillic acid under similar conditions results in ring contraction and formation of the lactone of cis,cis-1-carboxy-2-( $\alpha$ -hydroxybenzyl)-3-phenylcyclopropane as the major product. A cationic mechanism is invoked to explain the difference in behavior exhibited by these cyclobutane-1,3-dicarboxylic acids.  
 IT 2957-97-3  
 (Derived from data in the 7th Collective Formula Index (1962-1966))  
 RN 2957-97-3 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,3-dimethyl ester, (1 $\alpha$ ,2 $\beta$ ,3 $\alpha$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



L5 ANSWER 34 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 1966:438195 CAPLUS  
 DOCUMENT NUMBER: 65:38195  
 ORIGINAL REFERENCE NO.: 65:7072h  
 TITLE: 1,5,9-Tridehydro-12-annulene  
 AUTHOR(S): Sondheimer, F.; Wolovsky, R.; Garratt, P. J.; Calder, I. C.  
 CORPORATE SOURCE: Univ. Chem. Lab., Cambridge, UK  
 SOURCE: Journal of the American Chemical Society (1966), 88(11), 2610  
 CODEN: JACSAT; ISSN: 0002-7863  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB Correction. Isomer B reported (CA 64, 6515e) was shown to be identical with the title compound  
 IT 2957-97-3  
 (Derived from data in the 7th Collective Formula Index (1962-1966))  
 RN 2957-97-3 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,3-dimethyl ester, (1 $\alpha$ ,2 $\beta$ ,3 $\alpha$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



L5 ANSWER 35 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1966:85300 CAPLUS  
DOCUMENT NUMBER: 64:85300  
ORIGINAL REFERENCE NO.: 64:16081g-h,16082a  
TITLE: Esters of 1,2,3,4-cyclobutanetetracarboxylic acid as plasticizers for resins and rubbers  
INVENTOR(S): Rhum, David; Maggart, Ronald C.; Roper, Robert  
PATENT ASSIGNEE(S): Esso Research and Engineering Co.  
SOURCE: 3 pp.  
DOCUMENT TYPE: Patent  
LANGUAGE: Unavailable  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 3236801		19660222	US 1963-255073	19630130

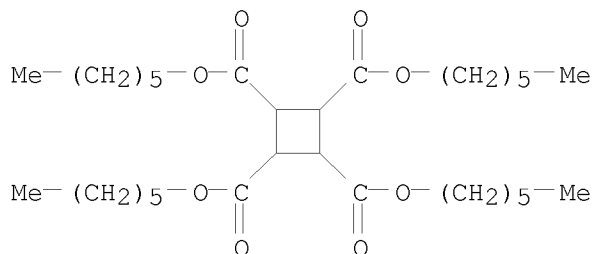
PRIORITY APPLN. INFO.: US 19630130

AB Esters of 1,2,3,4-cyclobutanetetracarboxylic acids are prepared by direct esterification of the appropriate 1,2,3,4-cyclobutanetetracarboxylic acid, dianhydride or acid chloride, by transesterification, or by direct dimerization of a dialkyl maleate or fumarate. When used in amts. of 5-150 parts per 100 parts resin, they give improved low-temperature properties, less volatile loss, and a better compatability-volatility relation. Thus, a mixture of 45 g. tetra-Me 1,2,3,4-cyclobutanetetracarboxylate, 127.5 g. Oxo hexyl alc. and 0.5 g. NaOMe was heated under N to .apprx.140°. After removing most of the alc., the solution was cooled, washed and vacuum stripped to yield tetrahexyl 1,2,3,4-cyclobutanecarboxylate. Fifty parts of this plasticizer was milled into 100 parts of Geon 101 poly(vinyl chloride) containing 2 parts stabilizer. Molded samples gave the following properties (compared with controls containing equal amts. of adipic polyester and dioctyl phthalate): volatility (% plasticizer loss after 7 hrs. at 136°), monomeric tetrahexyl ester 24, adipic polyester 17, dioctyl phthalate 91; % retention of elongation (after 7 hrs. at 136°), monomeric tetrahexyl ester 73, adipic polyester, 76, dioctyl phthalate zero.

IT 7566-44-1, 1,2,3,4-Cyclobutanetetracarboxylic acid, tetrahexyl ester  
(vinyl chloride polymers plasticized by)

RN 7566-44-1 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetrahexyl ester (CA INDEX NAME)

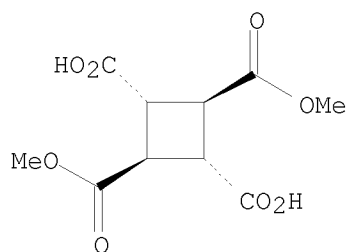


L5 ANSWER 36 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1965:438739 CAPLUS  
DOCUMENT NUMBER: 63:38739  
ORIGINAL REFERENCE NO.: 63:6882b-e  
TITLE: Electrochemical synthesis of a bicyclobutane  
AUTHOR(S): Vellturo, Anthony F.; Griffin, Gary W.

CORPORATE SOURCE: Tulane Univ., New Orleans, LA  
 SOURCE: Journal of the American Chemical Society (1965),  
 87(13), 3021-2  
 CODEN: JACSAT; ISSN: 0002-7863  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 GI For diagram(s), see printed CA Issue.  
 AB Electrolysis of trans,trans,trans-1,3-dicarboxy-2,4-  
 dicarbomethoxycyclobutane (I), m. 183-4°, under Kolbe conditions  
 gave 2,4-dicarbomethoxybicyclobutane (II), assumed to be cis, m.  
 83-5° whose structure was assigned on the basis of its ir and  
 N.M.R. spectra. Further evidence for this structure was obtained by  
 hydrogenation of H over PtO<sub>2</sub> to cis-1,3-dicarbomethoxycyclobutane (III),  
 MeO<sub>2</sub>C(CH<sub>2</sub>)<sub>4</sub>CO<sub>2</sub>Me, and MeO<sub>2</sub>CCH<sub>2</sub>CH<sub>2</sub>CHMeCO<sub>2</sub>Me. trans,trans,trans-I was  
 prepared by ozonolysis of the di-Me ester of ε-truxillic acid and  
 its structure confirmed by conversion to the known  
 trans,trans,trans-1,2,3,4-tetracarbomethoxycyclobutane (IV) on treatment  
 with CH<sub>2</sub>N<sub>2</sub>. It was established that I was not identical (ir spectrum and  
 mixed m.p.) with trans,trans,trans-1,2-dicarboxy-3,4-  
 dicarbomethoxycyclobutane (V), m. 167-70°, prepared by treating  
 dianhydride VI CA 61, 4233e with 2 equivs. of NaOMe. All attempts to  
 prepare trans,trans,trans-I from VI failed.  
 IT 2957-97-3  
 (Derived from data in the 7th Collective Formula Index (1962-1966))  
 RN 2957-97-3 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,3-dimethyl ester,  
 (1α,2β,3α,4β)- (CA INDEX NAME)

Relative stereochemistry.



L5 ANSWER 37 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 1965:438738 CAPLUS  
 DOCUMENT NUMBER: 63:38738  
 ORIGINAL REFERENCE NO.: 63:6881g-h,6882a-b  
 TITLE: Derivatives of tetrahydrodicyclopentadiene in the  
 field of fats. I. Tricyclodecamethanal as starting  
 material  
 AUTHOR(S): Kaufmann, H. P.; Grothues, B.  
 CORPORATE SOURCE: Deut. Inst. Fettforsch., Muenster, Germany  
 SOURCE: Fette, Seifen, Anstrichmittel (1965), 67(4), 249-55  
 CODEN: FSASAX; ISSN: 0015-038X  
 DOCUMENT TYPE: Journal  
 LANGUAGE: German  
 GI For diagram(s), see printed CA Issue.  
 AB Several derivs. of tricyclodecamethanal (I) were prepared and studied. I  
 2,4-dinitrophenylhydrazone, m. 144°, was obtained in 43% yield by  
 the usual method. 0.15 mole I in ether solution was treated with dry HCl gas.  
 The mixture was neutralized with K<sub>2</sub>CO<sub>3</sub> and extracted with ether, giving a 50%  
 yield of I diethyl acetal, b<sub>11</sub> 141-3°. By treating I with 1 and 2  
 moles, respectively, of malonic acid in a pyridine-piperidine solution,  
 β-tricyclodecylacrylic acid (II), m. 157°, and

$\beta$ -tricyclodecylglutaric acid, m. 179°, were obtained. By removing the crystalline II from the reaction mixture, a sirupy isomer of II,

b11

197-200°, could be isolated. From the crystalline II was prepared by the usual method II anilide (66% yield), m. 163°, whereas the sirupy II yielded 95% II anilide, b5 150-60°, and 84% II Me ester, b10 162-5°. The appearance of the II isomers was studied by their catalytic hydrogenation which yielded a mixture of tricyclodecylpropionic acids: a sirupy isomer, b6 166-8°, and a crystalline form, m. 81°. This was taken as evidence that the source of the isomerism lies in the tetrahydrodicyclopentadienyl ring system. Oxidation with KMnO4 of the crystalline II yielded tricyclodecylcarboxylic acid (III), m. 114°, whose anilide, m. 143°, was obtained in 41% yield. The reduction with LiAlH4 of I yielded a viscous mixture of alcs. which could not be resolved, although a well defined 3,5-dinitrobenzoate derivative, m. 71°, was obtained. By treating III with HN3, tricyclodecylamine (IV), b11 103°, was isolated in 49% yield; IV N-benzoyl derivative, m. 123°, was prepared in 35% yield.

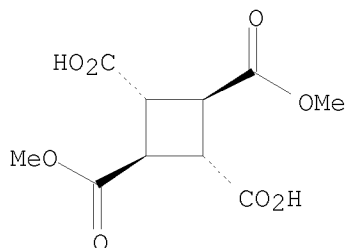
IT 2957-97-3

(Derived from data in the 7th Collective Formula Index (1962-1966))

RN 2957-97-3 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,3-dimethyl ester,  
(1 $\alpha$ ,2 $\beta$ ,3 $\alpha$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



L5 ANSWER 38 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1965:82131 CAPLUS

DOCUMENT NUMBER: 62:82131

ORIGINAL REFERENCE NO.: 62:14523b-d

TITLE: New routes into the  
cis,trans,cis-tricyclo[5.3.0.002.6]decane series

AUTHOR(S): Buchta, Emil; Merk, Wolfgang

CORPORATE SOURCE: Univ. Erlangen, Nuremberg, Germany

SOURCE: Naturwissenschaften (1965), 52(6), 130

CODEN: NATWAY; ISSN: 0028-1042

DOCUMENT TYPE: Journal

LANGUAGE: German

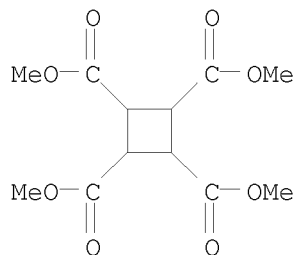
GI For diagram(s), see printed CA Issue.

AB I (R = CO2Et), m. 144-5°, reduced with LiAlH4 in dry tetrahydrofuran gave I (R = CH2OH, m. 62-4°, which with p-MeC6H4SO2Cl yielded I (R = p-MeC6H4SO2CH2) (II), m. 126.5-7°. II with NaCH(CO2Et)2 in refluxing xylene gave 82% III (R1 = R2 = R3 = R4 = CO2Et) (IV), b0.03 185-7° m. 66-7.5° (petr. ether). IV reduced with LiAlH4 in dry tetrahydrofuran gave 75% III (R1 = R2 = R3 = R4 = CH2OH), m. 242-4°. Saponification of IV gave crude III (R1 = R2 = R3 = R4 = CO2H), which decarboxylated at 210-20° yielded a mixture of III (R1 = R3 = H, R2 = R4 = CO2H) and III (R1 = R4 = H, R2 = R3 = CO2H), m. 250-70° (sealed capillary).

IT 14495-41-1

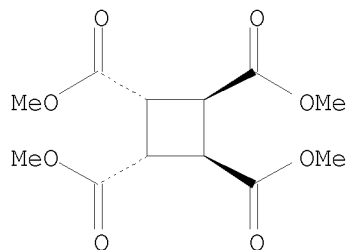
(Derived from data in the 7th Collective Formula Index (1962-1966))

RN 14495-41-1 CAPLUS  
CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)

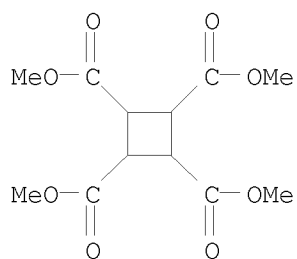


IT 1032-95-7P, 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester, cis,trans,cis-  
RL: PREP (Preparation)  
(preparation of)  
RN 1032-95-7 CAPLUS  
CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



L5 ANSWER 39 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN  
ACCESSION NUMBER: 1965:82130 CAPLUS  
DOCUMENT NUMBER: 62:82130  
ORIGINAL REFERENCE NO.: 62:14523a-b  
TITLE: Isomerization via transannular enolate anion  
AUTHOR(S): Fukunaga, Tadamichi  
CORPORATE SOURCE: E. I. du Pont de Nemours & Co., Wilmington, DE  
SOURCE: Journal of the American Chemical Society (1965), 87(4), 916-17  
CODEN: JACSAT; ISSN: 0002-7863  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
GI For diagram(s), see printed CA Issue.  
AB A base-catalyzed isomerization reaction of the half-cage ketone (I) to the iso-half-cage ketone (II) was reported. I with tert-BuOK in tert-BuOH in a sealed tube at 250° quant. gave II, containing .apprx.4% I. The ir and N.M.R. spectra of II were discussed.  
IT 14495-41-1  
(Derived from data in the 7th Collective Formula Index (1962-1966))  
RN 14495-41-1 CAPLUS  
CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



L5 ANSWER 40 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1965:73878 CAPLUS

DOCUMENT NUMBER: 62:73878

ORIGINAL REFERENCE NO.: 62:13056c-h,13057a-b

TITLE: Synthesis of cyclobutane derivatives from unsaturated fatty acid esters. Photochemical reactions of muconic acid dimethyl ester and sorbic acid methyl ester

AUTHOR(S): Kaufmann, Hans P.; Sen Gupta, Achintya K.

CORPORATE SOURCE: Deut. Inst. Fettforsch., Muenster, Germany

SOURCE: Justus Liebig's Annalen der Chemie (1965), 681, 39-44

CODEN: JLACBF; ISSN: 0075-4617

DOCUMENT TYPE: Journal

LANGUAGE: German

GI For diagram(s), see printed CA Issue.

AB Irradiation of muconic acid di-Me ester (I) and sorbic acid Me ester (II) in C<sub>6</sub>H<sub>6</sub> in the presence of Ph<sub>2</sub>CO gave cyclobutane derivs. along with cis,-trans isomers. trans,trans-I (10.5 g.) suspended in 1 l. absolute C<sub>6</sub>H<sub>6</sub> containing 2 g. Ph<sub>2</sub>CO irradiated 40 h. at 20° with a Hg high pressure burner (200-w.) with stirring and exclusion of O in a Jena glass flask, and the solution worked up gave 2.2 g. unchanged trans,trans-I, m. 157°, 1.99 g. Ph<sub>2</sub>CO, m. 48°, 142 mg. cis,cis-I, m. 75°, 201 mg. solid, m. 55°, 210 mg. cis,trans-I, m. 75°, 658 mg. trans,trans-I, m. 158°; 28 mg. unidentified oil, 6.92 g. III and IV, oil, and 130 mg. unidentified oil. Cis,cis-I was (III) (R = CO<sub>2</sub>Me, R<sub>1</sub> = CH:CHCO<sub>2</sub>Me) (V) (R = CO<sub>2</sub>H, R<sub>1</sub> = CH:CHCO<sub>2</sub>H) (VI) (R = R<sub>1</sub> = CO<sub>2</sub>H) (VIII) (R = CO<sub>2</sub>Me, R<sub>1</sub> = CH:CHMe) (X) (R = Me, R<sub>1</sub> = CH:CHCO<sub>2</sub>Me) (IV) (R = R<sub>2</sub> = CO<sub>2</sub>Me, R<sub>1</sub> = R<sub>3</sub> = CH:CHCO<sub>2</sub>Me) (VII) (R = R<sub>2</sub> = CO<sub>2</sub>H, R<sub>1</sub> = R<sub>3</sub> = CH:CHCO<sub>2</sub>H) (IX) (R = Me, R<sub>1</sub> = CH:CHMe, R<sub>2</sub> = CO<sub>2</sub>Me, R<sub>3</sub> = CH:CHCO<sub>2</sub>Me) saponified to cis,cis-muconic acid, m. 184°, which treated with H<sub>2</sub>SO<sub>4</sub> gave γ-carboxymethyl-δα,β-crotonolactone, m. 110°. cis,cis-I heated 4 h. in H<sub>2</sub>O gave cis,trans-I, m. 75°. cis,-trans-I was converted into trans,trans-I, m. 158°, by irradiating its MeOH solution in the presence of a trace of iodine. The III-IV mixture above in 50 cc. Et<sub>2</sub>O kept 16 h. at -30° and the precipitate (3.39 g.) filtered [the filtrate (A) was kept] and recrystd. twice from MeOH gave III, m. 43°. III (1 g.) refluxed 8 h. with 20 cc. 10% MeOH-NaOH, the solution diluted with H<sub>2</sub>O and extracted exhaustively with EtOAc, the

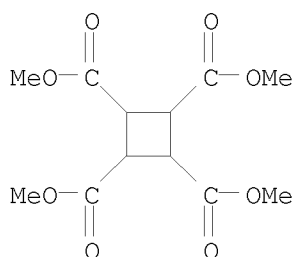
extract dried and evaporated in vacuo, and the residue (0.6 g. V) in 150 cc. 2% aqueous NaOH treated portion-wise with KMnO<sub>4</sub> during .apprx.4 h. at the b.p. and worked up gave 185 mg. trans,trans,trans-VI, m. 260-4° (Me<sub>2</sub>CO petr. ether); tetra-Me ester (via CH<sub>2</sub>N<sub>2</sub>) m. 126-7° (C<sub>6</sub>H<sub>6</sub>-petr. ether). Filtrate A gave trans,trans,trans-IV, m. 57-8° (aqueous MeOH), saponified (8 h. reflux with 10% MeOH-NaOH) to trans,trans,trans-VII, m. 245° (decomposition) (EtOAc-Me<sub>2</sub>CO-petr. ether), which (0.5 g.) oxidized with KMnO<sub>4</sub> as above gave 185 mg. trans,trans,trans-VI, m. 260-4° (Me<sub>2</sub>CO-petr. ether). trans,trans-II (20 g.) in 2 l. absolute C<sub>6</sub>H<sub>6</sub> containing 5 g. Ph<sub>2</sub>CO irradiated like I 100 h. at 20° with stirring and worked up gave 14.7 g. unchanged crude trans, trans-II, 5.0 g. Ph<sub>2</sub>CO, trans,trans,trans-VIII (1.88 g. crude), colorless oil, n<sub>D</sub>20 1.4796, mol. weight (cryoscopic in C<sub>6</sub>H<sub>6</sub>) 246, saponification number 438, 441

[trans,trans,trans-VIII (1 g.) saponified by alkali and the oily saponification product oxidized with alkaline KMnO<sub>4</sub> as above gave 168 mg. trans,trans,trans-VI, m. 262°], trans,trans,trans-IX (0.99 g. crude), colorless oil, n<sub>20</sub>D 1.4841, mol. weight (cryoscopic in C<sub>6</sub>H<sub>6</sub>) 249, saponification number 440.9 [trans,trans,trans-IX (0.5 g.) saponified and subsequently oxidized with KMnO<sub>4</sub> gave 43 mg. trans,trans,trans-VI], and trans,trans,trans-X (2.51 g. crude), b<sub>0.15</sub> 89-92°, mol. weight (cryoscopic in C<sub>6</sub>H<sub>6</sub>) 248.6, saponification number 442.4, which (1 g.) saponified and oxidized with KMnO<sub>4</sub> gave 40 mg. trans,trans,trans-VI, m. 260-4°.

IT 14495-41-1  
 (Derived from data in the 7th Collective Formula Index (1962-1966))

RN 14495-41-1 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)

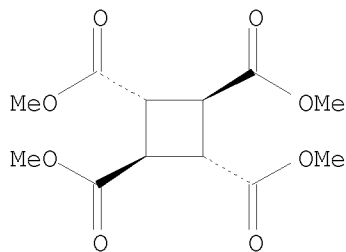


IT 3999-67-5P, 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester, trans,trans,trans-  
 RL: PREP (Preparation)  
 (preparation of)

RN 3999-67-5 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester, (1 $\alpha$ ,2 $\beta$ ,3 $\alpha$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.



L5 ANSWER 41 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1965:73877 CAPLUS

DOCUMENT NUMBER: 62:73877

ORIGINAL REFERENCE NO.: 62:13056b-c

TITLE: Substituted cyclopropanones

AUTHOR(S): Breslow, Ronald; Altman, L. J.; Krebs, Adolf; Mohacsi, Erno; Murata, Ichiro; Peterson, Ruth A.; Posner, Judd

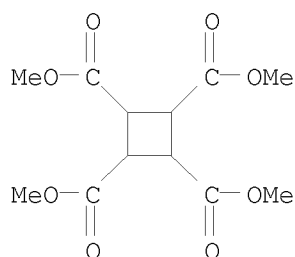
CORPORATE SOURCE: Columbia Univ.

SOURCE: Journal of the American Chemical Society (1965), 87(6), 1326-31

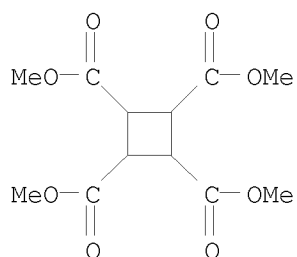
CODEN: JACSAT; ISSN: 0002-7863

DOCUMENT TYPE: Journal

LANGUAGE: English  
 OTHER SOURCE(S): CASREACT 62:73877  
 AB Dipropylcyclopropenone (I) may be synthesized by addition of dichlorocarbene to dipropylacetylene; under some conditions a cyclobutenone derivative is also formed. Elimination of HBr from bis(bromobutyl) ketone also affords I, along with a cyclopentenone derivative. The same HBr elimination route has been used to prepare dibutylcyclopropenone, cycloheptenocyclopropenone, and cycloundecenocyclopropenone. Properties and reactions of these compds. and synthetic approaches to other cyclopropenones are described.  
 IT 14495-41-1  
 (Derived from data in the 7th Collective Formula Index (1962-1966))  
 RN 14495-41-1 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)

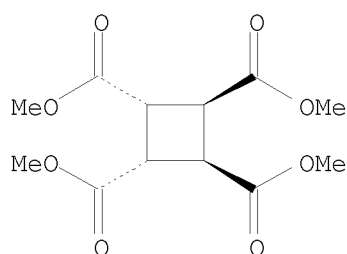


L5 ANSWER 42 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 1965:15312 CAPLUS  
 DOCUMENT NUMBER: 62:15312  
 ORIGINAL REFERENCE NO.: 62:2769b-e  
 TITLE: Photochemical studies. II. Structure of the photodimers of carbostyryl and N-methylcarbostyryl  
 AUTHOR(S): Buchardt, O.  
 CORPORATE SOURCE: Univ. Copenhagen  
 SOURCE: Acta Chemica Scandinavica (1964), 18(6), 1389-96  
 CODEN: ACHSE7; ISSN: 0904-213X  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 GI For diagram(s), see printed CA Issue.  
 AB cf. CA 59, 13946a. Chemical and spectroscopic evidence show that the dimers of carbostyryl and N-methylcarbostyryl have the trans-head-head-cyclobutane structures (I, R = H and I, R = Me), resp. The dimers I (R = H) and I (R = Me) were ozonized and oxidized with H<sub>2</sub>O<sub>2</sub> and the products were hydrolyzed with dilute HCl and methylated directly to yield, in both cases, tetramethyl cis-trans-cis-cyclobutanetetracarboxylate. Attempts to methylate I (R = H) to give I (R = Me) were unsuccessful so that the two compds. were interrelated as follows. I (R = Me) was reduced with LiAlH<sub>4</sub> in Et<sub>2</sub>O to give II (R = Me), m. 184-5°; monomethiodide m. 185-6°; dimethiodide m. 260-70°. Reduction of I (R = H) with LiAlH<sub>4</sub> gave II (R = H), m. 125-6°, which on treatment with MeI and then aqueous KOH gave II (R = Me). The trans-head-head configuration in both compds. was established by measurement of dipole moments in C<sub>6</sub>H<sub>6</sub> [2.53 D. for II (R = H) and 5.28 D. for I (R = Me)].  
 IT 14495-41-1  
 (Derived from data in the 7th Collective Formula Index (1962-1966))  
 RN 14495-41-1 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



IT 1032-95-7P, 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester, cis,trans,cis-  
 RL: PREP (Preparation)  
 (preparation of)  
 RN 1032-95-7 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.

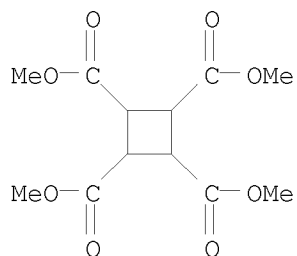


L5 ANSWER 43 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 1964:440150 CAPLUS  
 DOCUMENT NUMBER: 61:40150  
 ORIGINAL REFERENCE NO.: 61:6937c-d  
 TITLE: Purification of nitrocyclohexane  
 INVENTOR(S): Chandler, Ollie W.  
 PATENT ASSIGNEE(S): Commercial Solvents Corp.  
 SOURCE: 2 pp.  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Unavailable  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 3132183		19640505	US	

AB To a 600 g. portion of the crude product from the nitration of cyclohexane consisting of 94.7% nitrocyclohexane (I) with cyclohexanone, cyclohexyl nitrate, and nitrocyclohexane as impurities, was added 100 g. of 96% H<sub>2</sub>SO<sub>4</sub> at such a rate as to give a final temperature of 70°. The mixture was held at 70° with thorough agitation 3 hrs. After the addition of 100 ml. of H<sub>2</sub>O, the mixture was steam distilled at atmospheric pressure to give 540 g. product containing 99.5% I. Cf. Smiley, CA 53, 2243b.

IT 14495-41-1  
 (Derived from data in the 7th Collective Formula Index (1962-1966))  
 RN 14495-41-1 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)

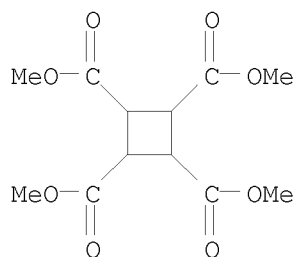


L5 ANSWER 44 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 1964:440149 CAPLUS  
 DOCUMENT NUMBER: 61:40149  
 ORIGINAL REFERENCE NO.: 61:6937b-c  
 TITLE: Photodimerization of fumaric acid derivatives  
 INVENTOR(S): Griffin, Gary W.  
 PATENT ASSIGNEE(S): American Cyanamid Co.  
 SOURCE: 2 pp.  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Unavailable  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 3139395		19640630	US 1961-81224	19610109
PRIORITY APPLN. INFO.:			US	19610109

AB Cyclobutanetetracarboxylic acid or their Me esters are made by subjecting a solid layer of di-Me fumarate to light waves of 1750-4000 A. The cyclobutane dianhydride can be made by a similar method from maleic anhydride irradiated in the solid state. Thus, a solution of di-Me fumarate in CH<sub>2</sub>Cl<sub>2</sub> is deposited on the inside wall of a glass cylinder, the CH<sub>2</sub>Cl<sub>2</sub> evaporated, and a lamp inserted in the cylinder. Irradiation is maintained for 24 hrs. with cooling to give 59% the tetramethyl ester of cis, trans, cis-1,2,3,4-cyclobutanetetracarboxylic acid, m. 144-5°. Also prepared were cis, trans, cis-1,2,3,4-tetracyanocyclobutane, m. 250° (decomposition), 1,2,3,4-cyclobutanetetracarboxylic acid dianhydride, and tetra-Me trans, trans, trans-1,2,3,4-cyclobutanetetracarboxylate, m. 123-5°.

IT 14495-41-1  
 (Derived from data in the 7th Collective Formula Index (1962-1966))  
 RN 14495-41-1 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



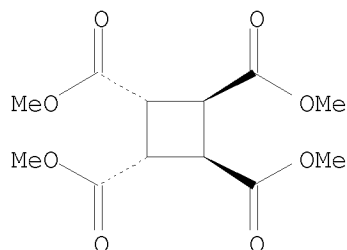
IT 1032-95-7P, 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester, cis, trans, cis- 3999-67-5P,  
 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester, trans, trans,

trans-  
RL: PREP (Preparation)  
(preparation of)

RN 1032-95-7 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

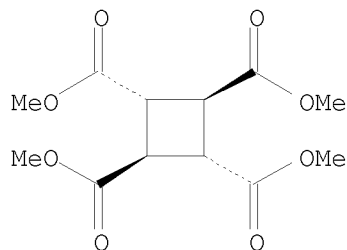
Relative stereochemistry.



RN 3999-67-5 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
(1 $\alpha$ ,2 $\beta$ ,3 $\alpha$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.



L5 ANSWER 45 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1964:425032 CAPLUS

DOCUMENT NUMBER: 61:25032

ORIGINAL REFERENCE NO.: 61:4233e-h,4234a-b

TITLE: Reductive cleavage of tetrasubstituted cyclobutanes:  
possible examples of homolytic fragmentations

AUTHOR(S): Griffin, G. W.; Hager, R. B.

CORPORATE SOURCE: Yale Univ.

SOURCE: Rev. Chim., Acad. Rep. Populaire Roumaine (1962),  
7(2), 901-6

DOCUMENT TYPE: Journal

LANGUAGE: English

GI For diagram(s), see printed CA Issue.

AB cf. CA 57, 16417d. Several possible examples of homolytic fragmentation of tetrasubstituted cyclobutanes were considered, employing Mg-MgI<sub>2</sub> in THF (in ether-benzene the mixture was inactive) and Na in liquid NH<sub>3</sub> for the reductive cleavage. Reduction of trans,trans,trans-1,2,3,4-tetrabenzoylcyclobutane (Ia) with Mg-MgI<sub>2</sub> and subsequent hydrolysis gave high yields (61%) of dibenzoyl ethane instead of the expected intramol. pinacol reduction, with a dienolate (II) presumed as initial product.

Reduction

of trans,trans,trans-1,2,3,4-tetracarboxymethoxycyclobutane (Ib) with Na and hydrolysis gave only di-Me succinate (25% yield) while similar treatment of the cis,trans,cis-1,2,3,4-tetracarboxymethoxycyclobutane (III) gave the same di-Me succinate (23%). Similar treatment of the tetraketone (Ic)

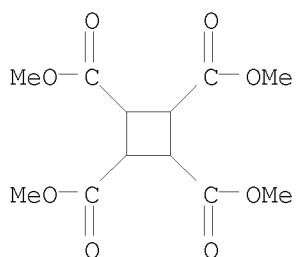
gave 2,5-hexanedione (53%) as major product and of the dioxodiester (Id), both 2,5-hexanedione (24%) and di-Me succinate (4%) and some Me levulinate (IV) (12%). Details were presented on the preparation of (Ic) and the unusual cage dianhydride (VI). The tetraketone (Ic), m. 139-40°, was prepared in 57% yield from the tetradiazoketone (V) by the action of HI in CHCl<sub>3</sub>. VI, m. 280° (decomposition), was prepared in 65% yield by treatment of Ie with Ac<sub>2</sub>O. Methanolysis of VI afforded Ig, and conversion of the latter through its acid chloride and diazoketone gave the trans,trans,trans-1,2-diacetyl-3,4-dicarbomethoxycyclobutane (Id), m. 81-2°, in 83% yield from VI. Dibenzoyl ethane was cleaved under similar conditions to give a low yield of acetophenone and 1,2-diphenyl-1,2-dihydroxycyclobutane, m. 147-50°. A photochem. reductive cleavage of Ia to dibenzoyl ethane was accomplished by irradiating in benzene in Pyrex glass vessels in the presence of benzophenone as photosensitizer. The same photosensitizer was used for photochem. reduction of dibenzoyl ethylene, using iso-PrOH, cyclohexane, or SnBu<sub>3</sub>H as H donors. Several possible interpretations were presented on the mechanism of the apparently general cleavage reaction. 28 refs.

IT 14495-41-1

(Derived from data in the 7th Collective Formula Index (1962-1966))

RN 14495-41-1 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)

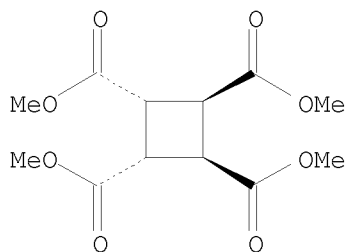


IT 1032-95-7, 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester, cis,trans,cis- 3999-67-5,  
1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
trans,trans,trans-  
(reductive cleavage of)

RN 1032-95-7 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

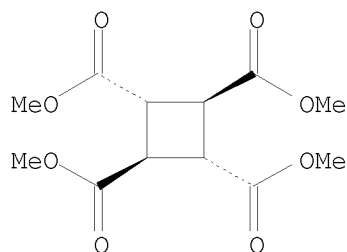
Relative stereochemistry.



RN 3999-67-5 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
(1 $\alpha$ ,2 $\beta$ ,3 $\alpha$ ,4 $\beta$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.



L5 ANSWER 46 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1964:425031 CAPLUS

DOCUMENT NUMBER: 61:25031

ORIGINAL REFERENCE NO.: 61:4233d-e

TITLE: Cyclobutane compounds. I. Formation of a four-membered ring during the electrophilic addition of hydrogen bromide to allene

AUTHOR(S): Griesbaum, Karl

CORPORATE SOURCE: Esso Res. & Eng. Co., Linden, NJ

SOURCE: Journal of the American Chemical Society (1964), 86(11), 2301-3

CODEN: JACSAT; ISSN: 0002-7863

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

GI For diagram(s), see printed CA Issue.

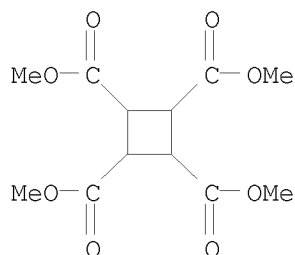
AB The reaction of equimolar amts. of HBr and CH<sub>2</sub>:C:CH<sub>2</sub> (I) produced (yields from gas-liquid chromatography) 13% CH<sub>2</sub>:CBrMe, 35% Me<sub>2</sub>CBr<sub>2</sub>, 44% trans-1,3-dibromo-1,3-dimethylcyclobutane (II), m. 54-5°, δ 2.13 (singlet) and 3.19 (singlet) p.p.m., and 8% cis-1,3-dibromo-1,3-dimethylcyclobutane (?). Reduction of II with Bu<sub>3</sub>SnH produced a mixture of cis- and trans-1,3-dimethylcyclobutane. The formation of II represented the first example of a cationically induced cyclodimerization of I.

IT 14495-41-1

(Derived from data in the 7th Collective Formula Index (1962-1966))

RN 14495-41-1 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



L5 ANSWER 47 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1964:52579 CAPLUS

DOCUMENT NUMBER: 60:52579

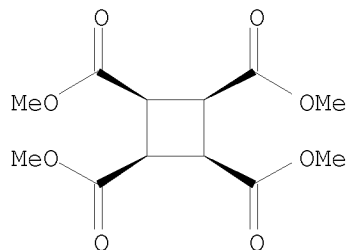
ORIGINAL REFERENCE NO.: 60:9210e-h,9211a

TITLE: Investigations in the cyclobutane series. XII. Two stereoisomeric dimers of cyclobutadiene

AUTHOR(S): Avram, Margarete; Dinulescu, Ilie G.; Marica, Elise; Mateescu, Georg; Sliam, Elvira; Nenitzescu, Costin D.

CORPORATE SOURCE: Acad. R. V. R., Bucharest, Rom.  
 SOURCE: Chemische Berichte (1964), 97(2), 382-9  
 CODEN: CHBEAM; ISSN: 0009-2940  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Unavailable  
 OTHER SOURCE(S): CASREACT 60:52579  
 GI For diagram(s), see printed CA Issue.  
 AB The elimination of Cl from cis-3,4-dichlorobutene (I) with Na-Hg in Et<sub>2</sub>O yielded syn-tricyclo[4.2.0.0<sup>2.5</sup>]octa-3,7-diene (II). I with Li-Hg gave similarly predominantly the anti isomer (III) of II. The ozone cleavage and several derivs. of II and III are described. I in Et<sub>2</sub>O shaken 40 hrs. with 0.5% Na-Hg, and the solution treated with saturated aqueous AgNO<sub>3</sub> yielded 46-51% AgNO<sub>3</sub> complex (IV) of II, m. 138-40°. IV shaken at 0° with saturated aqueous NaCl yielded 65-9% II, b<sub>40</sub> 45°, containing 2-3% cyclooctatetraene (V). I in Et<sub>2</sub>O shaken 8-10 hrs. with 0.5% Li-Hg, and the solution shaken with saturated aqueous AgNO<sub>3</sub> gave 55% AgNO<sub>3</sub>-complex (VI) of III, m. 152° (EtOH). VI shaken at 0° with saturated aqueous NaCl yielded 51% III, b<sub>40</sub> 40°, m. .apprx.-15°. II in 90% AcOH ozonized 8 hrs. and treated 36 hrs. with 30% H<sub>2</sub>O<sub>2</sub> yielded 77% all-cis-1,2,3,4-tetracarboxymethoxycyclobutane (VII), m. 202°. III yielded similarly 85% cis-trans-trans-isomer of VII, m. 147° (C<sub>6</sub>H<sub>6</sub>). III in MeOH hydrogenated over 30% Pd-C yielded anti-tricyclo[4.2.0.0<sup>2.5</sup>]-octane (VIII), b<sub>30</sub> 53°. VIII heated 8-10 hrs. under argon at 150° gave 39% dimeric 1,5-cyclooctadiene (IX), m. 121° (sealed capillary), and a liquid hydrocarbon C<sub>8</sub>H<sub>12</sub>, isolated as the yellow PdCl<sub>2</sub> complex, m. 205-10° (decomposition) (AcOH). II hydrogenated similarly gave the syn isomer (X) of IX, which, rearranged thermally, yielded 12.5% IX. II in CH<sub>2</sub>Cl<sub>2</sub> treated at 0° with Br gave 77% 3,4,7,8-tetra-Br derivative (XI) of X, pale yellow viscous liquid, which deposited on standing a hexabromide, m. 168° (MeOH). III yielded similarly 94% 3,4,7,8-tetra-Br derivative (XII) of XI, m. 172° (heptane). XII in Et<sub>2</sub>O shaken 10 hrs. with 0.5% Li-Hg gave 52% III. XII in PhCl heated 2 hrs. at 130-40° gave 77.5% C<sub>8</sub>H<sub>8</sub>Br<sub>4</sub>, m. 136-7° (AcOH). XII and 2,5-diphenyl-3,4-benzofuran (XIII) in Et<sub>2</sub>O shaken 16 hrs. with 0.5% Li-Hg, the precipitate treated with maleic anhydride, and the product refluxed 15 min. with 5% KOH-MeOH yielded 43% adduct, m. 252°. 1,2,3,4-Tetrabromocyclobutane, XIII, and 0.5% Li-Hg in Et<sub>2</sub>O yielded similarly 6% adduct, m. 288-90° (AcOH). The infrared absorption spectra of II, III, VIII, and X are recorded.  
 IT 31351-41-4P  
 RL: SPN (Synthetic preparation); PRP (Properties); PREP (Preparation)  
 (Investigations in the cyclobutane series. XII. Two stereoisomeric dimers of cyclobutadiene)  
 RN 31351-41-4 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\alpha$ ,4 $\alpha$ )-(9CI) (CA INDEX NAME)

Relative stereochemistry.

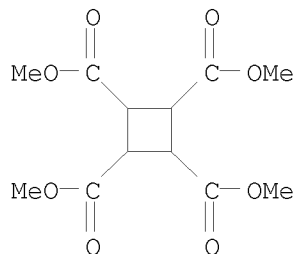


IT 14495-41-1P, 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl

ester, stereoisomers  
RL: PREP (Preparation)  
(preparation of)

RN 14495-41-1 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA  
INDEX NAME)



L5 ANSWER 48 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1963:435251 CAPLUS

DOCUMENT NUMBER: 59:35251

ORIGINAL REFERENCE NO.: 59:6273e-h, 6274a

TITLE: The tricyclo[5.3.0.02,6]decane system. Photodimers of cyclopentenone

AUTHOR(S): Eaton, Philip E.

CORPORATE SOURCE: Univ. of California, Berkeley

SOURCE: Journal of the American Chemical Society (1962),  
84(12), 2344-8

CODEN: JACSAT; ISSN: 0002-7863

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

OTHER SOURCE(S): CASREACT 59:35251

GI For diagram(s), see printed CA Issue.

AB The photodimers of cyclopentenone (I) were shown to be II and III. II was converted by 2 paths into cis,trans,cis-tricyclo[5.3.0.02,6]deca-4,9-diene-3,8-dione (IV). The cis,trans,cis assignment for II, III, and other derivs. was based partially on NMR data. Irradiation of I 24 h. with a Hg arc lamp through Pyrex glass gave 43-49% II, m. 125-6.5° (sublimed at 0.5 mm. and crystallized from CH<sub>2</sub>Cl<sub>2</sub>-hexane) and 37-45% III, m. 66-7° (hexane). Wolff-Kishner reduction of II and III gave cis,trans,cis-tricyclo[5.3.0.02,6]decane, identified by gas chromatog. II with monoperoxyphthalic acid in ether yielded 60% V, m. 156-7° (C<sub>6</sub>H<sub>6</sub>-CCl<sub>4</sub>). III similarly gave 55% VI, m. 103-5°. Methanolysis of V over polystyrenesulfonic acid resin was accomplished without rearrangement to give putative 1,3-bis(2-carbomethoxyethyl)cyclobutane-2,4-diol,  $\lambda$  2.87 (OH), 5.77  $\mu$  (ester CO), which reverted to V on attempted distillation VI similarly yielded 1,2-bis(2-carbomethoxyethyl)cyclobutane-3,4-diol, oxidizable with Pb(OAc)<sub>4</sub>. II with isopropenyl acetate and p-MeC<sub>6</sub>H<sub>4</sub>SO<sub>3</sub>H gave 58 (crystallized from hexane) or 26% (chromatographed on neutral Al<sub>2</sub>O<sub>3</sub>) dienol acetate (VII), m. 95-6°, which with Na<sub>2</sub>CO<sub>3</sub> in aqueous MeOH reverted to II. VII (16.00 g.) in CH<sub>2</sub>Cl<sub>2</sub> at -65° with 20.65 g. Br yielded 13.4 g. putative tetrabromide, which with tert-BuOK in tert-BuOH refluxed overnight yielded 36% IV, m. 231-3°. II with (HOCH<sub>2</sub>)<sub>2</sub> and HCl gave 91% bis(ethylene ketal), m. 143-3.5°, which (54.5 g.) in THF with 174 g. pyridinium bromide perbromide yielded 54% dibromo derivative (VIII), m. 200° (decomposition). VIII with tert-BuOK in Me<sub>2</sub>SO (not in tert-BuOH) gave 84% bis(ethylene ketal), m. 177-8° (hexane), of IV, which with 0.1N HCl in THF yielded 91% IV. Hydrogenation of IV in AcOH over Pd-C yielded II. IV in aqueous AcOH with ozone and then H<sub>2</sub>O<sub>2</sub> followed by treatment with CH<sub>2</sub>N<sub>2</sub> afforded 28% cis,trans,cis-tetracarboxymethoxycyclobutane, m.

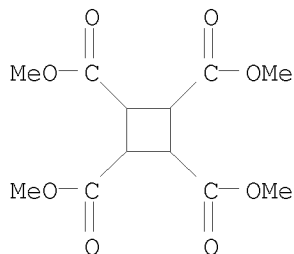
143-4°. NMR spectra of IV-VI were given.

IT 14495-41-1

(Derived from data in the 7th Collective Formula Index (1962-1966))

RN 14495-41-1 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



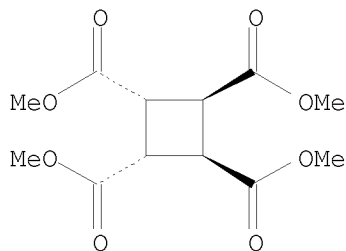
IT 1032-95-7P, 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester, cis,trans,cis-  
RL: PREP (Preparation)

(preparation of)

RN 1032-95-7 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



L5 ANSWER 49 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1963:435250 CAPLUS

DOCUMENT NUMBER: 59:35250

ORIGINAL REFERENCE NO.: 59:6273a-e

TITLE: Behavior of norbornadiene and its 7-alkoxy derivatives towards organolithium reagents

AUTHOR(S): Wittig, Georg; Otten, Joachim

CORPORATE SOURCE: Univ. Heidelberg, Germany

SOURCE: Tetrahedron Letters (1963) 601-6

CODEN: TELEAY; ISSN: 0040-4039

DOCUMENT TYPE: Journal

LANGUAGE: German

GI For diagram(s), see printed CA Issue.

AB cf. CA 55, 8455c. Treatment of norbornadiene (I) in Et<sub>2</sub>O with PhLi under various conditions gave the metalated product (II), the 2 addition compds. (III, IV, R = Li, R' = Ph) and dimeric norbornadiene, b<sub>16</sub> 121-4°, m. 33°, consisting of a mixture of 2 isomeric compds. The reaction of I with organolithium compds., R'Li, took place relatively slowly, in days at room temperature and in 24 hrs. at 70° and was still more retarded in petr. ether. I treated 6 days with Me<sub>2</sub>CHLi in petr. ether at 20° and the mixture hydrolyzed yielded 50% IV (R = H, R' = Me<sub>2</sub>CH) together with 34% I. Similarly, I treated 2 days in petr. ether at

20° with Me<sub>3</sub>CLi gave 62% IV (R = H, R' = Me<sub>3</sub>C) and unchanged I. On the contrary, the addition of R'Li in petr. ether at -20° and hydrolysis of the precipitated material yielded 87% product (VII, R = CMe<sub>3</sub>, R'

=

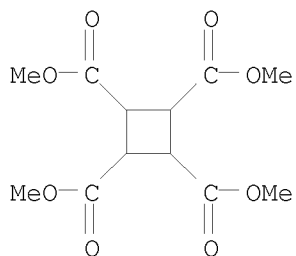
Me<sub>2</sub>CH), b<sub>13</sub> 91°, n<sub>20D</sub> 1.4558, and 91% VII (R = CMe<sub>3</sub>, R' = Me<sub>3</sub>C), b<sub>13</sub> 106°, n<sub>20D</sub> 1.4616. The mixture prior to hydrolysis heated 2 hrs. at 100° gave VIII (R = Me<sub>2</sub>CH) (IX), b<sub>60</sub> 76°, n<sub>25D</sub> 1.4661, and 60% VIII (R = Me<sub>3</sub>C), b<sub>20</sub> 64°, n<sub>20D</sub> 1.4718. IX hydrogenated in the presence of prereduced PtO<sub>2</sub> with adsorption of 1.98 moles H gave 7-isopropylbornane, b. 165°, n<sub>20D</sub> 1.4580, identical with material prepared by treatment of 7-bromonorbornane with Me<sub>2</sub>CHBr and Na. Similarly, V (R = Me) treated with Me<sub>2</sub>CHLi in petr. ether gave an adduct, hydrolyzed to yield 94% VII (R = Me, R' = Me<sub>2</sub>CH). The mixture heated prior to hydrolysis gave about 50% VIII (R' = Me<sub>2</sub>CH). V(R = Me<sub>3</sub>C) (VI) in moist Et<sub>2</sub>O saturated with dry HCl gave 68% VIII (R' = Cl), b<sub>13</sub> 46°, n<sub>25D</sub> 1.5060, m. -16 to -14°, refluxed 4 hrs. in MeOH to give 68% V (R = Me), b<sub>18</sub> 44°, n<sub>20D</sub> 1.4792. VI treated with MeOH or EtOH in the presence of a trace of HClO<sub>4</sub> yielded 66% V (R = Me) and 82% V (R = Et), resp. The structure of the 7-substituted norbornadienes was conformed by the nuclear magnetic resonance signals for olefin H, bridgehead H, bridge H, and other H atoms: VIII, R = Me<sub>2</sub>CH, 3.27, 3.49, 6.64, 7.80-8.90, 9.22, 9.31; VIII, R = Me<sub>3</sub>C, 3.14, 3.60, 6.58, 7.58, 9.21; VIII, R = Cl, 3.26, 3.40, 6.38, 5.83; V, R = Me, 3.45, 3.59, 6.54, 6.88; V, R = Et, 3.44, 3.59, 6.38-6.92, 8.93. The above observations suggest that the reactions take place through the 7-norbornadienyl cation (Winstein and Ordroneau, CA 55, 4383i).

IT 14495-41-1

(Derived from data in the 7th Collective Formula Index (1962-1966))

RN 14495-41-1 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



L5 ANSWER 50 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1963:72985 CAPLUS

DOCUMENT NUMBER: 58:72985

ORIGINAL REFERENCE NO.: 58:12431g-h

TITLE: The photodimerization of monomethyl fumarate

AUTHOR(S): Sadeh, T.; Schmidt, G. M. J.

CORPORATE SOURCE: Weismann Inst. Sci., Rehovoth, Israel

SOURCE: Journal of the American Chemical Society (1962), 84, 3970

CODEN: JACSAT; ISSN: 0002-7863

DOCUMENT TYPE: Journal

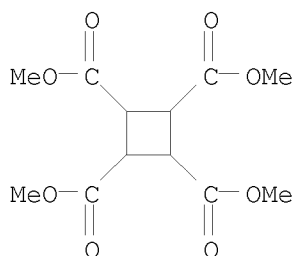
LANGUAGE: Unavailable

GI For diagram(s), see printed CA Issue.

AB Ultraviolet irradiation of a powdered sample of monomethyl fumarate yielded the dimer (I), m. 153-4°. Treatment with SOCl<sub>2</sub> gave its anhydride, m. 144°. Treatment of both the material and its anhydride with methanolic HCl gave tetramethyl cyclobutane-1,2,3,4-tetracarboxylate m. 144-5°. The conformation of the dimer of monomethyl fumarate was

therefore established as having symmetry m, the two acid groups being cis to each other and trans to the two ester groups.

IT 14495-41-1P  
RL: SPN (Synthetic preparation); PRP (Properties); PREP (Preparation)  
(The photodimerization of monomethyl fumarate)  
RN 14495-41-1 CAPLUS  
CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



L5 ANSWER 51 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1962:473604 CAPLUS

DOCUMENT NUMBER: 57:73604

ORIGINAL REFERENCE NO.: 57:14619b-d

TITLE: Mechanism of formation of basic amino acids (ornithine) and hydroxyamino acids (serine, homoserine) by photochemical synthesis

AUTHOR(S): Ferrari, G.; Passera, C.

CORPORATE SOURCE: Univ. Padua, Italy

SOURCE: Photochemistry and Photobiology (1962), 1, 155-8  
CODEN: PHCBAP; ISSN: 0031-8655

DOCUMENT TYPE: Journal

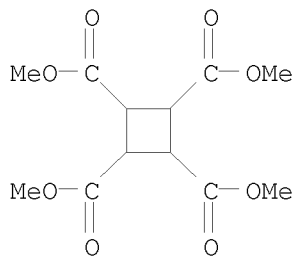
LANGUAGE: Unavailable

AB Dicarboxylic diamino acids, monocarboxylic diamino acids, and hydroxyamino acids were synthesized in a study of the action of ultraviolet rays on diluted solns. of inorg. N compds. and ternary organic substances. Hydroxyamino acids are formed by recombination of OH radicals from H<sub>2</sub>O<sub>2</sub> with amino-group-containing radicals from primary amino acids.  $\alpha,\delta$ -Diaminoadipic acid, arising by recombination of amino-group-containing radicals from aspartic acid, yields ornithine by further photochem. decarboxylation. The mechanism of formation is discussed.

IT 14495-41-1  
(Derived from data in the 7th Collective Formula Index (1962-1966))

RN 14495-41-1 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



ACCESSION NUMBER: 1962:473603 CAPLUS  
 DOCUMENT NUMBER: 57:73603  
 ORIGINAL REFERENCE NO.: 57:14619a-b  
 TITLE: Synthesis of  $\gamma$ -keto acids by photochemical reaction  
 AUTHOR(S): Odaira, Yoshinobu; Tominaga, Tamotsu; Pak, Cheng King; Tsutsumi, Shigeru  
 SOURCE: Technology Reports of the Osaka University (1962), 12(Nos. 488-507), 193-7  
 CODEN: TROUAI; ISSN: 0030-6177  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Unavailable

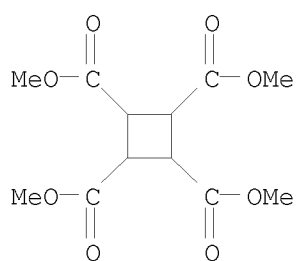
AB The photochem. addition reactions of some aldehydes and di-Me fumarate(I) and maleate (II) were studied. Thus, 4-oxoheptanoic acid was prepared from 2 moles butyraldehyde and 1 mole II, exposed to a lowpressure Hg lamp at room temperature for 100 hrs. Increase in the mole ratio of aldehyde to ester increased the formation of the 1:1 ketodiester adduct except in the case of HCHO. Irradiation of I in the solid state yielded a photodimer identified as *cis,trans,cis*-1,2,3,4-tetracarboxymethoxycyclobutane.

IT 14495-41-1

(Derived from data in the 7th Collective Formula Index (1962-1966))

RN 14495-41-1 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



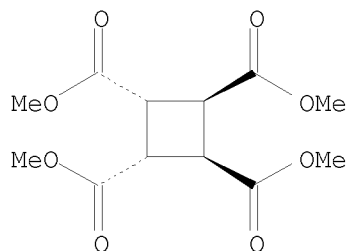
IT 1032-95-7P, 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester, *cis,trans,cis*-  
 RL: PREP (Preparation)

(formation by irradiation of di-Me fumarate)

RN 1032-95-7 CAPLUS

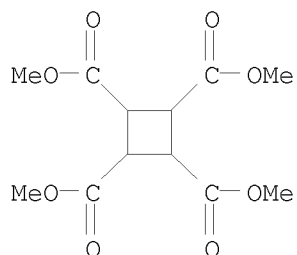
CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



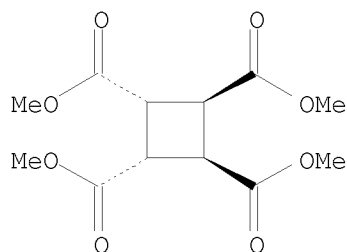
ACCESSION NUMBER: 1962:436298 CAPLUS  
 DOCUMENT NUMBER: 57:36298

ORIGINAL REFERENCE NO.: 57:7239c-h  
 TITLE: Photosensitized cyclodimerization of coumarin  
 AUTHOR(S): Schenck, Guenther Otto; Wilucki, Iugeborg v.; Krauch, Carl Heinrich  
 CORPORATE SOURCE: Max-Planck-Inst. Kohleforschung, Muehlheim, Germany  
 SOURCE: Chemische Berichte (1962), 95, 1409-12  
 CODEN: CHBEAM; ISSN: 0009-2940  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Unavailable  
 OTHER SOURCE(S): CASREACT 57:36298  
 GI For diagram(s), see printed CA Issue.  
 AB Coumarin (I) without sensitization yielded II, with sensitization III and IV, upon irradiation. The 2 reactions do not have common intermediates. I (29 g.), m. 67-70°, and 5 g. BzPh, m. 48°, in 250 cc. C6H6 irradiated 60 hrs. at 10-15° gave 27.9 g. III, m. 176.5° (EtOH, C6H6, AcOH and sublimed in vacuo); the mother liquor yielded 0.45 g. IV, m. 320-5° (sublimed); 4.57 g. BzPh was recovered. I (29 g.) in 250 cc. C6H6 irradiated 125 hrs. in glass or 45 hrs. in quartz gave only unchanged I. I (12.3 g.) in 110 cc. absolute EtOH irradiated 46 hrs. gave 1.17 g. II, m. 260° (decomposition) (AcOH and sublimed in vacuo). I (11.54 g.) and 3.08 g. BzPh in 150 cc. absolute EtOH irradiated 16 hrs. yielded 2.2 g. III. I (135 g.) irradiated 30 hrs. at 71-5° with an immersed quartz lamp gave 0.45 g. I. III (13 g.) in 700 cc. 80% AcOH ozonized 10 hrs. at 15° with about 25 g. O3/hr., treated with cooling with 250 cc. 10% H2O2, kept 2 days, evaporated, the residue treated with Et2O-CH2N2, and chromatographed on silica gel yielded 70.8% tetra-Me cis-trans-cis-eyelobutanetetracarboxylate, m. 144.5°. III (3 g.) in 50 cc. 10% aqueous NaOH acidified with 10% HCl and filtered gave 3.5 g. dihydroxy-μ-truxinic acid (V), m. 175° after melting with bubbling at 95° and resolidification at 150°. V refluxed 2 hrs. with Ac2O gave III. V (3.32 g.) and CH2N2-Et2O yielded 3.2 g. di-Me ester of V. m. 160° (decomposition). III (5 g.) with 9 g. Me2SO4 in 41 cc. 2N NaOH yielded 3.04 g. Me ester (VI) of dimethoxy-μ-truxinic acid (VII), m. 137-8° (decomposition) (MeOH); the filtrate from the VI acidified with 10% HCl gave 3.07 g. VII, m. 200° (decomposition) (aqueous MeOH).  
 IT 14495-41-1  
 (Derived from data in the 7th Collective Formula Index (1962-1966))  
 RN 14495-41-1 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)

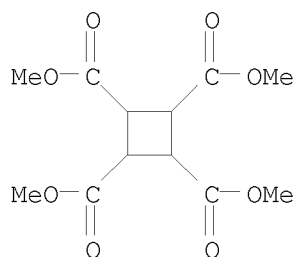


IT 1032-95-7P, 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester, cis,trans,cis-  
 RL: PREP (Preparation)  
 (preparation of)  
 RN 1032-95-7 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester, (1α,2α,3β,4β)- (CA INDEX NAME)

Relative stereochemistry.

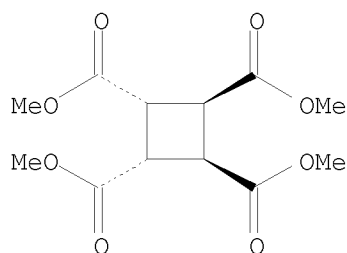


L5 ANSWER 54 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 1962:429516 CAPLUS  
 DOCUMENT NUMBER: 57:29516  
 ORIGINAL REFERENCE NO.: 57:5853f-g  
 TITLE: Preparation of some 2,3:6,7-dibenzobiphenylenes  
 AUTHOR(S): Bruce, J. Malcolm  
 CORPORATE SOURCE: Univ. Manchester, UK  
 SOURCE: Journal of the Chemical Society (1962) 2782-5  
 CODEN: JCSOA9; ISSN: 0368-1769  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Unavailable  
 GI For diagram(s), see printed CA Issue.  
 AB The photodimer (I) of 1,4-naphthoquinone was converted into 1,4,5,8-tetrahydroxy-2,3:6,7-dibenzobiphenylene, and the tetramethyl ether and tetraacetate of this compound were prepared Evidence is presented concerning structure of the enolic form of the photodimer (II) of 2,3-dimethyl-1,4-benzoquinone.  
 IT 14495-41-1  
 (Derived from data in the 7th Collective Formula Index (1962-1966))  
 RN 14495-41-1 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



IT 1032-95-7P, 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester, cis,trans,cis-  
 RL: PREP (Preparation)  
 (preparation of)  
 RN 1032-95-7 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



L5 ANSWER 55 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1962:429515 CAPLUS

DOCUMENT NUMBER: 57:29515

ORIGINAL REFERENCE NO.: 57:5853e-f

TITLE: Condensed cyclobutane aromatic compounds. XXI. Adducts of benzocyclobutadienes with 1,3-diphenylisobenzofuran

AUTHOR(S): Cava, M. P.; Pohlke, R.

CORPORATE SOURCE: Ohio State Univ., Columbus, OH, USA

SOURCE: Journal of Organic Chemistry (1962), 27(5), 1564-7

CODEN: JOCEAH; ISSN: 0022-3263

DOCUMENT TYPE: Journal

LANGUAGE: English

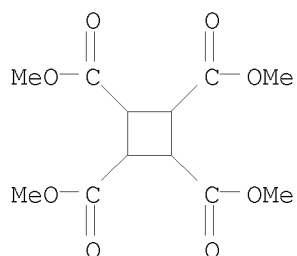
AB Diphenylisobenzofuran has been found to be an excellent trapping agent for benzocyclobutadiene and for halogenated benzocyclobutadienes. Some chemical transformations of the adducts obtained are reported.

IT 14495-41-1

(Derived from data in the 7th Collective Formula Index (1962-1966))

RN 14495-41-1 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



L5 ANSWER 56 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1962:403716 CAPLUS

DOCUMENT NUMBER: 57:3716

ORIGINAL REFERENCE NO.: 57:671i,672a-e

TITLE: The chemistry of photodimers of maleic and fumaric acids derivatives. III. cis,trans,cis-1,2,3,4-Tetracyanocyclobutane; possible precursors for tetramethylenecyclobutane

AUTHOR(S): Griffin, G. W.; Basinski, J. E.; Peterson, L. I.

CORPORATE SOURCE: Yale Univ.

SOURCE: Journal of the American Chemical Society (1962), 84, 1012-15

CODEN: JACSAT; ISSN: 0002-7863

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

OTHER SOURCE(S): CASREACT 57:3716

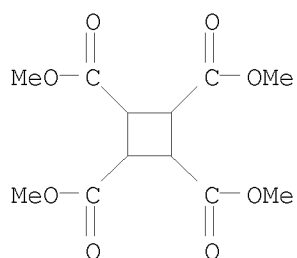
GI For diagram(s), see printed CA Issue.

AB The photodimerization of fumaronitrile (I) to cis-trans,cis-tetracyanocyclobutane (II) in the solid state has been studied and the stereochem. of II correlated with the crystal lattice structure of I. The chemical of II has been investigated and a series of compds. derived from I have been synthesized. I deposited on the inside of a 1-l. graduated cylinder by evaporating a solution of I under N, the deposit irradiated 1 wk with a germicidal lamp and extracted with hot Et2O left 2.1 g. II, p. 250° (decomposition) (MeCN). II (0.75 g.) added to 20 cc. AcOH and 1 cc. concentrated HCl, heated to solution, concentrated, and filtered yielded 0.393 g. III, m. 325° (Me2CO); the filtrate treated with CH2N2-Et2O gave the tetra-CO2Me analog of II, m. 144-5°. II (8.0 g.), 150 cc. Ac2O, and 0.70 g. PtO2 hydrogenated 1 wk at about 25° yielded 4.0 g. tetra-AcNHCH2 analog (IV) of II, m. 278-9° (H2O). IV (6.0 g.) and 35 cc. concentrated HCl heated 3 h. and evaporated, and the residue sublimed at 80°/0.5 mm. gave the extremely hygroscopic tetra-H2NCH2 analog (V) of II. V in 10% aqueous NaOH with BzCl yielded the tetra-BzNHCH2 analog of II, m. 302-3° (hot EtOH). Tetraacid chloride (VI) of 1,2,3,4-cyclobutanecarboxylic acid, m. 76-7° (hexane), from the acid with PCl5 in 200 cc. C6H6 treated 4 h. with stirring with gaseous Me2NH, heated to boiling, filtered, and evaporated gave 5.1 g. tetra-CONMe2 analog (VII) of II, m. 194-5° (Et2O-C6H6). VII (5.1 g.) in 100 cc. Et2O and 100 cc. C6H6 refluxed through a Soxhlet thimble charged with 1.7 g. LiAlH4, refluxed 1 h., and worked up gave 3.1 g. Me2NCH2 analog (VIII) of II, b0.05 110-12°. MeI (4.0 g.) and 1.0 g. VIII in 50 cc. absolute MeOH refluxed overnight and cooled yielded 2.4 g. tetramethiodide of VIII. VIII (4.0 g.) added with stirring and cooling to 60% H2O2, warmed after 6 h. to room temperature, kept overnight, heated with a small amount of Pt-C, filtered, and treated with picric acid gave the picrate of the tetra-N-oxide of VIII, m. 219-20°. VI (3 g.) in 150 cc. C6H6 treated with gaseous NH3 gave some III.

IT 14495-41-1 94253-09-5  
(Derived from data in the 7th Collective Formula Index (1962-1966))

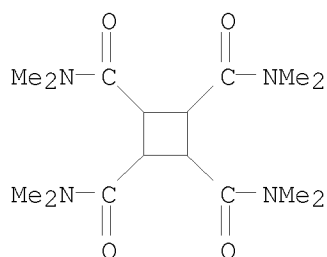
RN 14495-41-1 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



RN 94253-09-5 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxamide, N1,N1,N2,N2,N3,N3,N4,N4-octamethyl- (CA INDEX NAME)

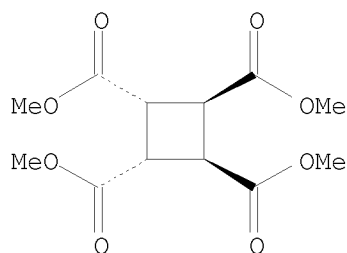


IT 1032-95-7P, 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester, cis,trans,cis- 905821-43-4P,  
1,2,3,4-Cyclobutanetetracarboxamide,  
N,N,N',N',N'',N'',N''',N'''-octamethyl-, cis,trans,cis-  
RL: PREP (Preparation)  
(preparation of)

RN 1032-95-7 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

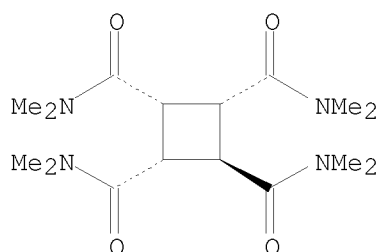
Relative stereochemistry.



RN 905821-43-4 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxamide, N1,N1,N2,N2,N3,N3,N4,N4-octamethyl-,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\alpha$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



L5 ANSWER 57 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1962:403715 CAPLUS

DOCUMENT NUMBER: 57:3715

ORIGINAL REFERENCE NO.: 57:670i,671a-i

TITLE: The chemistry of photodimers of maleic and fumaric acids derivatives. II. The preparation of cis-trans,cis-and trans,trans,trans-1,2,3,4-tetrabenzoylcyclobutane; the acid chlorides of 1,2,3,4-tetracarboxycyclobutanes

AUTHOR(S): Griffin, G. W.; Hager, R. B.; Veber, D. F.

CORPORATE SOURCE: Yale Univ.

SOURCE: Journal of the American Chemical Society (1962), 84, 1008-11

CODEN: JACSAT; ISSN: 0002-7863

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

AB cf. CA 55, 22159f. The acid chlorides of cis,trans,cis- (I) and trans,trans,trans-1,2,3,4-tetracarboxycyclobutane (II) were prepared and employed as precursors for several sym. 1,2,3,4-tetrasubstituted cyclobutane derivs. Dry I from 22 g. tetra-Me ester (III) of I refluxed 3 h. with 63.2 g. PCl<sub>5</sub> and evaporated, the residue dissolved in 50 cc. dry C<sub>6</sub>H<sub>6</sub>, added dropwise with stirring to 40.4 g. AlCl<sub>3</sub> in 300 cc. C<sub>6</sub>H<sub>6</sub>, stirred 2.5 h., poured into 500 cc. 10% HCl, stirred 1 h., and filtered, and the residue extracted 36 h. in a Soxhlet apparatus with 200 cc. CHCl<sub>3</sub> gave 7.5 g. cis,trans,cis-1,2,3,4-tetrabenzoylcyclobutane (IV), m. 259-61°. I (22.1 g.) and 79.2 g. PCl<sub>5</sub> refluxed 3 h. and distilled gave 17.5 g. tetraacid chloride (V) of I, m. 76-7° (repptd. from warm CCl<sub>4</sub> with hexane). V with MeOH gave III. II (20 g.) and 72.5 g. PCl<sub>5</sub> refluxed 5 h. gave 21.6 g. tetraacid chloride (VI) of II, b<sub>0.2</sub> 120-4°, m. 63-5°. VI with MeOH yielded 100% tetra-Me ester of II, m. 126-7°. VI (8.5 g.) in 120 cc. dry C<sub>6</sub>H<sub>6</sub> added during 15 min. to 15.8 g. AlCl<sub>3</sub> in 30 cc. C<sub>6</sub>H<sub>6</sub> at 5°, stirred 6 h. with warming to 20°, and worked up, and the crude product extracted 24 h. with C<sub>6</sub>H<sub>6</sub> in a Soxhlet apparatus gave 10 g.

IV trans,trans,trans-isomer (VII), m. 254-6° (PhMe). V (0.5 g.) and 1 g. NaOMe in 60 cc. CHCl<sub>3</sub> refluxed 15 min., diluted with H<sub>2</sub>O, and filtered, and the residue extracted with C<sub>6</sub>H<sub>6</sub> in a Soxhlet apparatus gave 0.20 g.

VII. IV heated 2.5 h. with 10% concentrated HCl in AcOH gave 13% VII. VII (1.0 g.) in 40 cc. dry THF added during 15 min. to PhMgBr from 2.7 g. PhBr and 0.48 g. Mg in 25 cc. dry THF, refluxed 1.5 h., and worked up, and the crude product extracted in a Soxhlet apparatus 0.5 h. with pentane, 0.5 h. with C<sub>6</sub>H<sub>6</sub>, and 12 h. with THF gave from the THF extract 0.25 g. trans,trans,trans-tetrakis(diphenylhydroxymethyl)cyclobutane, m. above 330°. VII (1.0 g.) extracted from a Soxhlet thimble into 0.15 g. LiAlH<sub>4</sub> in THF during 8 h. gave 0.98 g. trans,trans,trans-tetrakis(α-hydroxybenzyl)cyclobutane (VIII), m. 256-8° (50% EtOH). VIII (1.0 g.), 1.0 g. Cu chromite, and 100 cc. EtOH hydrogenated 8 h. at 250°/2000 lb. initial pressure yielded 0.5 g. trans,trans,trans-tetrabenzylcyclobutane (IX), m. 123-4°, also obtained in the same manner directly from VII. IV (0.67 g.) and 15 cc. N<sub>2</sub>H<sub>4</sub>.H<sub>2</sub>O heated 15 h. on the steam bath and filtered and the residue sublimed at 200°/0.15 mm. gave 0.15 g. 3,6-diphenylpyridazine, m. 221-2.5° (Me<sub>2</sub>CO). CF<sub>3</sub>CO<sub>3</sub>H from 3.8 cc. (CF<sub>3</sub>CO)<sub>2</sub>O and 0.040 cc. 90% H<sub>2</sub>O<sub>2</sub> in 6 cc. CH<sub>2</sub>Cl<sub>2</sub> added during 15 min. with stirring to 3.6 g. NaH<sub>2</sub>PO<sub>4</sub> and 1.0 g. VII in 60 cc. CH<sub>2</sub>Cl<sub>2</sub>, refluxed 20 h., and poured into 300 cc. H<sub>2</sub>O, the organic layer worked up, the residue digested with C<sub>6</sub>H<sub>6</sub> left 0.16 g. unchanged VII; the extract yielded 0.095 g. trans,trans,trans-tetracarboxyphenoxycyclobutane, m. 189-93° (C<sub>6</sub>H<sub>6</sub>). VI (30 g.) in 100 cc. Et<sub>2</sub>O added dropwise during 15 min. with stirring and cooling to 1.2 mol CH<sub>2</sub>N<sub>2</sub> in 2 l. Et<sub>2</sub>O, stirred 1 h. at room temperature, and concentrated gave 30.2 g. diazo ketone; a 30.0-g. sample in 1 l. MeOH stirred 4 h. at 61° with 3.5 g. Ag<sub>2</sub>O and worked up, the crude product digested with 150 cc. boiling Et<sub>2</sub>O, and the extract distilled yielded 9.8 g. tetra-Me ester (X) of trans,trans,trans-1,2,3,4-cyclobutanetetraacetic acid (XI), m. 59-61° (CCl<sub>4</sub>). X heated 0.5 h. at 60° in 20% H<sub>2</sub>SO<sub>4</sub> and cooled gave 92% XI, needles, m. 310-12°. IX (1.0 g.) in 50 cc. 90% aqueous AcOH treated 8 h. at room temperature with 1.3 g. O<sub>3</sub>/h., kept 2 days at room temperature in 10 cc. 30% H<sub>2</sub>O<sub>2</sub> in 26 cc. H<sub>2</sub>O, filtered, concentrated to 5 cc., and kept overnight yielded 0.12 g. XI. VI (9.0 g.) in 125 cc. C<sub>6</sub>H<sub>6</sub> treated with 7.6 g. activated NaN<sub>3</sub>, refluxed overnight, filtered hot,

treated with 100 cc. concentrated HCl, refluxed 0.5 h. with stirring, and the aqueous layer concentrated to 25 cc. and filtered yielded 3.0 g. trans,trans,trans-1,2,3,4-tetraminocyclobutane-4HCl (XII.4HCl). XII.4HCl (0.050 g.) triturated with NaOH and heated at 100°/0.1 mm. gave an extremely hygroscopic sublimate which benzoylated by the Schotten-Baumann procedure yielded the tetrakis(N-Bz derivative) of XII, m. 308-10° (EtOH). Mg (1.05 g.) in 35 cc. dry THF treated with 3.24 g. iodine, the suspension treated with 50 cc. dry THF and 1.0 g. VII during 24 h. (added by extraction from a Soxhlet thimble) under N, hydrolyzed with 50 cc. H2O, kept 1 h., evaporated, acidified with dilute HCl, and extracted with C6H6 gave 0.03

g.

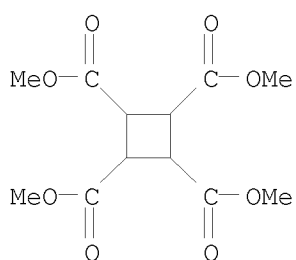
(BzCH2)2, m. 143-4.5° (EtOH).

IT 14495-41-1 94253-09-5

(Derived from data in the 7th Collective Formula Index (1962-1966))

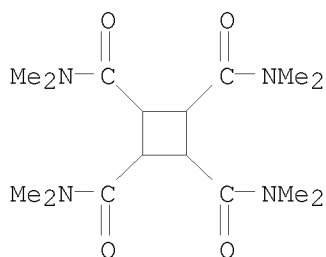
RN 14495-41-1 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



RN 94253-09-5 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxamide, N1,N1,N2,N2,N3,N3,N4,N4-octamethyl- (CA INDEX NAME)



L5 ANSWER 58 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1962:53033 CAPLUS

DOCUMENT NUMBER: 56:53033

ORIGINAL REFERENCE NO.: 56:9993i,9994a-i,9995a-b

TITLE: Organic sulfur compounds. IV. Some addition and cooxidation reactions of 4-chlorobenzenethiol with dicyclopentadiene and Aldrin

AUTHOR(S): Oswald, Alexis A.; Noel, Fernand

CORPORATE SOURCE: Imp. Oil Ltd., Sarnia, Can.

SOURCE: Journal of Organic Chemistry (1961), 26, 3948-57

CODEN: JOCEAH; ISSN: 0022-3263

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

AB cf. CA 54, 21005e.-4-Chlorobenzenethiol (I) readily added to exo- (II) and endo-dicyclopentadienes (III) and Aldrin (IV) by a radical mechanism to yield the exo (V) and endo isomers of

4-chlorophenylthiodihydro-dicyclopentadiene (VI) and 2-(p-chlorophenylthio)-endo-5,6,7,8,9,9-hexachloro-exo-endo-1,2,3,4,4a,5,8,8a-octahydro-1,4,5,8-dimethanonaphthalene (VII). When I solns. were air oxidized with any of the above diolefins, unstable hydroperoxide intermediates, p-chlorophenylthiohydroperoxydihydro-endo-dicyclopentadiene (VIII), p-chlorophenylthiohydroperoxydihydro-exo-dicyclopentadiene (IX), and exo-2-(p-chlorophenylthio)-3-hydroperoxy-endo-5,6,7,8,9,9-hexachloro-exo-endo-1,2,3,4,4a,5,8,8a-octahydro-1,4:5,8-dimethanonaphthalene (X) were obtained. The hydroperoxide intermediate of the thiol-IX cooxidn., X, was isolated as a colorless crystalline substance. In solution, it rearranged to the corresponding 2-(p-chlorophenylsulfinyl)-3-hydroxy derivative (XI). It was suggested that similar cooxidn. and not addition reactions of thiols and dicyclopentadiene were responsible for gum formation in some cracked gasolines. I was recrystd., m. 52-3° (heptane). Tech. IV was recrystd. from heptane then MeOH, m. 101-2°. III (13.2 g.) and 14.5 g. I mixed with rise in temperature, the temperature maintained below 70° by cooling, left 4 days at room temperature, and the mixture distilled gave 26.2 g. VI, b2 145-6°. III (13.2 g.) and 14.5 g. I each in 0.3 mole/l. concentration in heptane left 1

week

under N, evaporated, and the residue distilled gave 25.5 g. VI. About 0.09 g. tert-butyl hydroperoxide added to the heptane solution described above and left 1 week gave 93% VI. III (13.2 g.) and 29 g. I in heptane left 1 week gave 85% VI. Pure VI had n20D 1.6073. III (56 g.) and 224.5 g. aqueous HI stirred 12 hrs. under N with the temperature maintained below 50°, dissolved in Et2O, washed, and distilled gave 116 g.

iododihydro-exo-dicyclopentadiene (XII), b2 80-1°. XII (129.5 g.) and 67.2 g. KOH in 250 ml. 95% aqueous alc. refluxed 4 hrs. under N gave 40 g. II, b8 49-50°, n20D 1.5105. I (14.5 g.) and 13.2 g. II similarly treated gave 96% V, b2 146-7°, n20D 1.6053. VI 13.8 g.) in 40 ml. Ac2O and 15 ml. AcOH treated in 20 min. at about 50° with 11.2 g.

30% H2O2, left 24 hrs. at room temperature, diluted with H2O, concentrated, and the

product crystallized gave 8.5 g. 4-chlorophenylsulfonyldihydro-endo-dicyclopentadiene (XIII), m. 113-14.5°. In another experiment, 14.5 g. I and 14.5 g. III gave the adduct and the crude adduct in 200 ml. AcOH oxidized by slowly adding 22.4 g. H2O2 at 40° gave 27.8 g. XIII. Similarly V gave 57% 4-chlorophenylsulfonyldihydro-exo-dicyclopentadiene (XIV), m. 84-5°. In another experiment, the oxidation of 27.7 g. V carried out in 200 ml. AcOH with 22.4 g. H2O2 gave 70% XIV. Heptane solns. of 2.9 g. I and 7.3 g. IV were mixed under N and left 1 week at room temperature away from air to give 7.5 g. VII, m. 106.5-8.5°. A heptane solution (66 ml.) of the reagents prepared as above was irradiated in a quartz flask by an ultraviolet lamp 1 hr. and the product crystallized to give 8.5 g. VII. VII (5.1 g.) in 40 ml. 1:1 AcOH-Ac2O treated at 40° with 0.34 g. H2O2

in an aqueous 30% solution, the mixture kept 2 hrs. at that temperature, left overnight

at room temperature, concentrated, and the product crystallized gave two isomeric

sulfoxides, m. 206-8.5° and 190-3°, in 36% and 30% yields.

VII (5.1 g.) oxidized with 0.68 g. H2O2 as 30% solution gave 4.5 g. exo-2-(p-chlorophenylsulfonyl)-endo-5,6,7,8,9,9-hexachloro-exo-endo-1,2,3,4,4a,5,8,8a-octahydro-1,4:5,8-dimethanonaphthalene, m. 223-6°. I (14.5 g.) in 320 ml. heptane treated with passage of air, 13.2 g. III added, the air introduction continued 2 hrs. at room temperature, and the product crystallized gave two hydroxyethylsulfoxide

isomers, m.

218-20° and 182-4°. The heptane filtrate on evaporation left 7 g. oil, which on vacuum distillation afforded 5 g. VI; oxidation gave p-chlorophenylsulfonyldihydro-endo-dicyclopentadiene. O introduced at -5° into a 160 ml. heptane solution of 3.6 g. I and 3.3 g. III, after 1 hr. of oxygenation under ultraviolet light the liquor decanted, and cooled gave VIII, as crystals which became an oil at room temperature, n20D

1.5820. From the heptane filtrate I g. crystalline solid was obtained, browned at 140°, m. 175-85°. The above peroxidic products were combined and recrystd. to yield 4.4 g.

p-chlorophenylsulfinylhydroxydihydro-endo-dicyclopentadiene isomers described above. A 100 ml. heptane solution containing 4.8 g. I and 4.3 g. II aerated 2 hrs. and left overnight gave 4.1 g. semisolid. This was taken up in Me<sub>2</sub>CO, filtered, and the solid recrystd. to give 1.1 g.

p-chlorophenylsulfinylhydroxydihydro-exo-dicyclopentadiene, m.

167-8°. A 160 ml. heptane solution of 3.6 g. I and 3.3 g. II oxygenated at -5° under ultraviolet irradiation gave IX, unstable liquid, n<sub>D</sub> 1.5850. Into 333 ml. heptane solution containing 7.23 g. I and 18.25 g. IV air was introduced 3 hrs. at room temperature to give 9.7 g. X, m. 248-9° (decomposition). Another crystalline hydroxy sulfoxide isomer (XV) was obtained from the PhMe filtrate, m. 207-10°. Also obtained

from the mother liquor was 0.5 g. VII. Into a 162 ml. pentane solution of 3.62 g. I and 9.12 g. IV air was introduced with irradiation with an ultraviolet lamp to give after a total of 0.5 hr. 2 g. XI. On heating XI m. 116-19°, solidified, m. 240-2°. Further introduction of air into the filtered mixture resulted in precipitation of a XI, X, and XV

mixture A

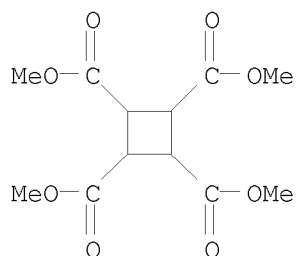
CCl<sub>4</sub> solution (15 ml.) of 0.27 g. XI left at room temperature gave 0.18 g. X.

IT 14495-41-1

(Derived from data in the 7th Collective Formula Index (1962-1966))

RN 14495-41-1 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



L5 ANSWER 59 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1962:53032 CAPLUS

DOCUMENT NUMBER: 56:53032

ORIGINAL REFERENCE NO.: 56:9993i

TITLE: Structure of Nenitzescu's dimer of benzocyclobutadiene

AUTHOR(S): Griffin, G. W.; Veber, D. F.

CORPORATE SOURCE: Yale Univ.

SOURCE: Chemistry & Industry (London, United Kingdom) (1961) 1162

CODEN: CHINAG; ISSN: 0009-3068

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

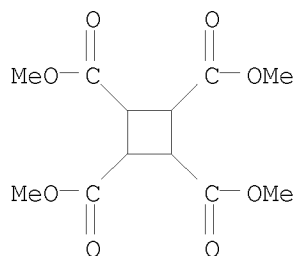
AB cf. CA 54, 24612a.-Nenitzescu's hydrocarbon (I), dibenzotricyclo[4.2.0.0<sup>2,5</sup>]octa-3,7-diene, was ozonized. The product, after esterification with diazomethane, was cis-trans-cis-1,2,3,4-tetracarboxymethoxycyclobutane, yield 28%, m. 142-4° (MeOH). The two aromatic nuclei in I were trans.

IT 14495-41-1

(Derived from data in the 7th Collective Formula Index (1962-1966))

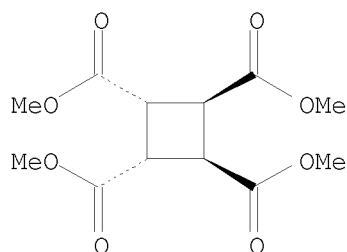
RN 14495-41-1 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



IT 1032-95-7P  
 RL: SPN (Synthetic preparation); PRP (Properties); PREP (Preparation)  
 (Structure of Nenitzescu's dimer of benzocyclobutadiene)  
 RN 1032-95-7 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



L5 ANSWER 60 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1961:137115 CAPLUS

DOCUMENT NUMBER: 55:137115

ORIGINAL REFERENCE NO.: 55:25787b-c

TITLE: Note on the all-cis-cyclobutane-1,2,3,4-tetracarboxylic acid

AUTHOR(S): Criegee, Rudolf; Funke, Wolfgang

CORPORATE SOURCE: Tech. Hochschule, Karlsruhe, Germany

SOURCE: Chemische Berichte (1961), 94, 2358-9

CODEN: CHBEAM; ISSN: 0009-2940

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

AB Powdered peri-truxillic acid anhydride (1.0 g.) in 130 cc. AcOH treated 18 hrs. at room temperature with 1.65 g. ozone/hr. and then with 10 cc. 30% H<sub>2</sub>O<sub>2</sub>, the mixture kept 24 hrs., heated slowly to 80°, cooled, evaporated in vacuo at 35°, the residue dissolved in a min. of hot AcOH, and the solution diluted after cooling dropwise with petr. ether yielded 50% all-cis-cyclobutane-1,2,3,4-tetracarboxylic acid, platelets, decomposed from 200°; it gave with CH<sub>2</sub>N<sub>2</sub> in tetrahydrofuran the tetra-Me ester, needles, m. 203-4° (after softening at 185°) (EtOAc and sublimed at 140°/0.01 mm.). The acid heated 1 hr. with Ac<sub>2</sub>O at 100° gave the dianhydride, darkened above 235° without melting, rhombs from Ac<sub>2</sub>O-dioxane.

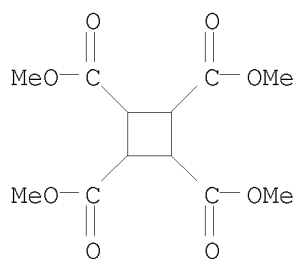
IT 14495-41-1P, 1,2,3,4-Cyclobutanetetracarboxylic acid, tetra-Me ester

RL: PREP (Preparation)

(preparation of)

RN 14495-41-1 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



L5 ANSWER 61 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1961:118138 CAPLUS

DOCUMENT NUMBER: 55:118138

ORIGINAL REFERENCE NO.: 55:22159f-i,22160a-c

TITLE: The chemistry of photodimers of maleic and fumaric

acid derivatives. I. Dimethyl fumarate dimer

AUTHOR(S): Griffin, G. W.; Vellturo, A. F.; Furukawa, K.

CORPORATE SOURCE: Yale Univ.

SOURCE: Journal of the American Chemical Society (1961), 83, 2725-8

CODEN: JACSAT; ISSN: 0002-7863

DOCUMENT TYPE: Journal

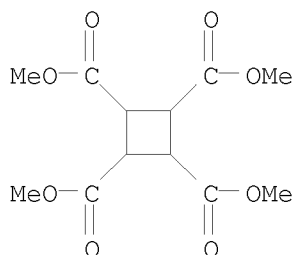
LANGUAGE: Unavailable

OTHER SOURCE(S): CASREACT 55:118138

AB The irradiation of di-Me fumarate (I) in the solid state gave cis,trans,cis-1,2,3,4-tetracarboxymethoxycyclobutane (II), whose stereochemistry can be rationalized in terms of direct bond formation between nearest neighbor mols. in the crystal lattice of the monomer. The isomerization of II to the thermodynamically more stable trans,trans,trans-isomer (III) of II was readily achieved thermally. The reduction of III and the hydrolysis of II and III as well as their reactions with PhMgBr were also studied. I (10 g.) in Me<sub>2</sub>CO evaporated under N in a glass cylinder rotating in nearly horizontal position, an ultraviolet lamp inserted into the cylinder, the I irradiated 1-5 days at 25-30°, and the product extracted with C<sub>6</sub>H<sub>6</sub> gave 60% II, m. 144-5°. II transesterified with PhCH<sub>2</sub>OH gave the tetra-PhCH<sub>2</sub> ester, m. 107.5-8.5° (C<sub>6</sub>H<sub>6</sub>-hexane). II (1.0 g.) heated in a Pyrex tube at 0.1 mm. 20 hrs. at 300° gave 50% III, m. 123-5°. II (0.28 g.) refluxed 2 hrs. with 0.3 g. NaOMe in MeOH, diluted with 10 cc. 10% aqueous NH<sub>4</sub>Cl, evaporated, and sublimed at 80°/0.01 mm. gave 18% III, m. 127° (H<sub>2</sub>O). II (5 g.) heated with concentrated HCl to solution on a steam bath, and the resulting acid, which lost H<sub>2</sub>O at 220-5°, treated with CH<sub>2</sub>N<sub>2</sub>-Et<sub>2</sub>O gave II. III (0.28 g.) and 5 cc. concentrated HCl gave the tetra-CO<sub>2</sub>H analog of III, m. 261-4° (decomposition) [AcOH-hexane or tetrahydrofuran (THF)-hexane], which sublimed gave the chair dianhydride (IV). Tetra-CO<sub>2</sub>H analog (V) of II (0.10 g.) heated 3 hrs. with SOCl<sub>2</sub> and evaporated, and the residue washed with hexane and sublimed, gave IV. V heated at 225-30°/0.05 mm. gave also IV. IV was identical with the photodimerization product from maleic anhydride. IV (0.50 g.), 2.50 g. PbO<sub>2</sub>, and 10 g. powdered glass heated 0.25 hr. at 250° with stirring under a stream of N (CO<sub>2</sub> was evolved) gave a residue containing no organic material. II (5.8 g.) in 150 cc. C<sub>6</sub>H<sub>6</sub> and 150 cc. dry Et<sub>2</sub>O reduced with 3.0 g. LiAlH<sub>4</sub> in the inverse manner and then treated dropwise with 25 cc. AcCl in 50 cc. Et<sub>2</sub>O and heated 12 hrs. gave 2.0 g. tetraacetate (VI) of cis,trans,cis-1,2,3,4-tetrakis(hydroxymethyl)cyclobutane (VII), b<sub>0.02</sub> 178-80°. VI (0.90 g.) and 2.0 g. KOH in 50 cc. MeOH refluxed 2 hrs. and evaporated, and the residue heated 3 hrs. with excess BzCl gave the tetrabenzoate of VII, m. 104-5°. V (1.0 g.) in 200 cc. boiling THF treated dropwise with 0.1 mole PhMgBr in 50 cc. dry THF gave 0.5 g. crystalline

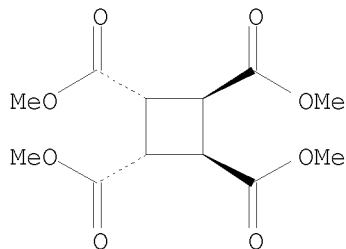
solid, m. 285-7° (decomposition) (C<sub>6</sub>H<sub>6</sub>); the infrared spectrum showed bands for a OH and a CO function. IV treated in 250 cc. THF dropwise with stirring with PhMgBr from 16 g. Mg, 72 cc. PhBr, and 75 cc. THF, the mixture refluxed 2 hrs., stirred 12 hrs. at room temperature, and worked up gave trans,trans,trans-1,2,3,4-tetrakis( $\alpha$ -hydroxybenzhydryl)cyclobutane (VIII), m. above 300° (absolute EtOH). VIII (0.50 g.), 1.0 g. CuO-Cu-Ba-chromite catalyst, and 100 cc. EtOH hydrogenolyzed 8 hrs. at 250° and 1900 lb. initial H pressure yielded 0.25 g. trans,trans,trans-1,2,3,4-tetrabenzhydrylcyclobutane, m. 284-7° (methylcyclohexane).

IT 14495-41-1  
 (Derived from data in the 6th Collective Formula Index (1957-1961))  
 RN 14495-41-1 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



IT 1032-95-7P  
 RL: SPN (Synthetic preparation); PRP (Properties); PREP (Preparation)  
 (The chemistry of photodimers of maleic and fumaric acid derivatives.  
 I. Dimethyl fumarate dimer)  
 RN 1032-95-7 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\beta$ )- (CA INDEX NAME)

Relative stereochemistry.



L5 ANSWER 62 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 1961:118137 CAPLUS  
 DOCUMENT NUMBER: 55:118137  
 ORIGINAL REFERENCE NO.: 55:22158e-i,22159a-f  
 TITLE: Dimethylketene dimer. I. Catalytic hydrogenation and ring cleavage by alcohols  
 AUTHOR(S): Hasek, Robert H.; Elam, Edward U.; Martin, James C.; Nations, Ronald G.  
 CORPORATE SOURCE: Tennessee Eastman Co., Kingsport  
 SOURCE: Journal of Organic Chemistry (1961), 26, 700-4  
 CODEN: JOCEAH; ISSN: 0022-3263  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Unavailable

OTHER SOURCE(S): CASREACT 55:118137

GI For diagram(s), see printed CA Issue.

AB Optimal conditions for hydrogenation of dimethylketene dimer (I) to the corresponding glycol (II) were sought and excellent yields obtained with a Ru-C catalyst. I (400 g.) in 600 ml. MeOH hydrogenated at 125°/1000-1500 lb./sq. in. 1 hr. with 20 g. 5% Ru-C with rocking in a stainless steel autoclave and the filtered solution evaporated yielded 98%

II,  
2,2,4,4-tetramethyl-1,3-cyclobutanediol, m. 129-50°. I (285 g.) in 400 ml. MeOH hydrogenated 18 hrs. at 150°/100 atmospheric with 20 g. Raney Ni, the filtered solution hydrogenated 5 hrs. with 50 g. Raney Ni under the same conditions, the filtered solution evaporated, the residue distilled in vacuo,

the product (91 g., b2 50-80°) combined with material (140 g., b3 62-72°) from a similar run, and the mixture fractionated through an 8 ft. spinning band column (10:1 reflux ratio) gave 26 ml. Me2CHCOCMe2CO2R (III, R = Me) (IV), b3.1-3.4 51.0-1.8°, contaminated with a small amount of Me2CHCOCMe2CH2OH (V), and 25 ml. V, b3.5-3.6 62.6°, n20 D 1.4382,  $\lambda$  2.9, 5.9, 7.3-7.4  $\mu$ ; p-O2NC6H4CO derivative m. 83-4°. I (28 g.) in 300 ml. MeOH hydrogenated with 0.2 mole H with stirring at 40°/3 atmospheric with 4 g. Raney Ni in EtOH, the filtered solution evaporated, and the residue recrystd. from C6H6 yielded 70% 3-hydroxy-2,2,4,4-tetramethylcyclobutanone, m. 114°; 2,4-dinitrophenylhydrazine m. 154.5-6.0° (corrected). I (100 g.) and 100 g. MeOH autoclaved (N atmospheric) 12 hrs. at 160° and the filtered solution distilled yielded 32% IV, converted by N2H4 to 4,4-dimethyl-3-isopropyl-2-pyrazolin-5-one, m. 81.5-2.5° (corrected). Na (0.1 g.) in 100 ml. absolute alc. at 10° treated portionwise (external cooling) below 50° with 50 g. I, the mixture acidified with 2 ml. AcOH, and distilled yielded 87% III (R = Et). Me3COH (250 ml.)

containing

4 g. 50% dispersion of NaH in mineral oil stirred with 140 g. I, the mixture heated slowly to 60° to initiate an exothermic reaction, the self-refluxing solution stirred 1 hr., acidified with 10 ml. AcOH, and

distilled

yielded 73% III (R = Me3C). I (70 g.), 15 g. HOCH2CH2OH, and 15 ml. C5H5N autoclaved 12 hrs. at 200° and the homogeneous product distilled gave 20 g. forerun and 77% III (R = CH2CH2) (bis compound). I (100 g.), 50 g. II, and 0.5 g. Na heated to 100°, the slurry treated with 2 ml. absolute alc. with immediate rise of temperature to 140-5°, the temperature maintained 45 min. before cooling, and the product repeatedly recrystd. from Me2CO yielded 57% III (R = HC.CMe2.CH.CMe2) (his compound), m. 113-14°. The base-catalyzed alcoholysis of I was used to prepare a series of esters. Further study showed that phenols and mercaptans were similarly esterified, although at a somewhat slower rate. I (80 g.), 53 g. PhOH, and 0.1 g. Na heated to 90°, 2 ml. absolute alc. added, heating continued to 190-5°, the mixture kept at this temperature 30 min., and the cooled mixture distilled yielded 86% III (R = Ph). I (70 g.) and 101 g. C12H25SH refluxed 3 hrs. with stirring with 0.5 g. Na in 300 ml. xylene, the low-boiling components removed at 215°/3 mm., and the residue distilled in a cyclic falling film mol. still at 78-88°/0.02 mm. gave 72% Me2CHCOCMe2COSR (VI, R = C12H25). Data for III and VI were tabulated [R, % yield, b.p./mm. or m.p. (solvent), and n20D given]. III: Me, 32, 88-91°/22, 1.4244; Et, 87, 81.5-82°/9.5, 1.4230; Me2CH, 54, 113-16°/36, 1.4209; H2C:CHCH2, 73, 95-6°/10, 1.4369; Bu, 18, 113-14°/14, 1.4288; Me3C, 73, 100-4°/16, 1.4212; Ph, 86, 95-6°/0.5, 1.4859; CH2CH2 (diester), 77, 185-7°/5.5, 1.4484; HOCH2CMe2CH2, 56, 130-9°/2.5-3.5, 1.4488; CH2CMe2CH2 (diester), 5, 184°/3.5, 1.4488; S(CH2CH2)2 (diester), 93.5, 110°/0.004, 1.4720; MeCH2C(CH2)3 (triester), 52, 140°/0.001, 1.4587; C(CH2)4 (tetraester), 57, 91-2° (Me2CO-C6H14; p-C6H4 (diester), 11, 106-7° (alc.), VI: C12H25, 72, 78-88°/0.02, 1.4705; (CH2)6 (diester), 76, 108-33°/1.0,

1.4951; p-Me<sub>3</sub>CC<sub>6</sub>H<sub>4</sub>, 60, 58-9° (alc.). II (321 g.) and 276 g. HCO<sub>2</sub>H refluxed 5 hrs. in 200 ml. C<sub>6</sub>H<sub>6</sub>, the cooled solution refluxed 4 hrs. with 276 g. HCO<sub>2</sub>H, the cooled solution diluted with C<sub>6</sub>H<sub>6</sub>, the washed and dried solution evaporated, and the residue distilled through a 48 in. packed column yielded

315

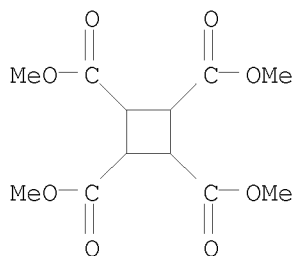
g. 98%-pure 2,2,4,4-tetramethyl-1,3-cyclobutanediol diformate (VII), b<sub>53</sub> 132-3°. VII (315 g.) stored at 20° and filtered gave 167 g. solid, m. 58-65°, recrystd. from petr. ether to give 144 g. trans-II diformate (VIII), m. 67-8°. VIII (132 g.) in 900 ml. MeOH containing 2 g. Na kept 24 hrs. at 20°, treated with 9 ml. AcOH, evaporated on a steam bath, the residue taken up in 900 ml. boiling PhMe, the filtered solution concentrated to 450 ml., and the cooled mixture filtered gave 78 g. oven-dried (108°) trans-II, m. 148°. The filtrate from VIII converted to the free glycol by methanolysis, the mixture of glycol isomers crystallized from PhMe to give 79 g. material, m. 130-54°, a sample (57 g.) refluxed in 400 ml. PhMe, the solution cooled to 80°, the supernatant liquid decanted, the crystalline residue taken up in 400 ml. boiling PhMe, cooled to 100°, the supernatant decanted, and the crystalline product (24 g., m. 160-3°) recrystd. from 350 ml. PhMe yielded 22 g. pure cis-II, m. 162.5-3.5°. The configuration of the glyxol isomers was assigned on the basis of nuclear magnetic resonance spectra since cis-II contains 2 types of Me groups, whereas all Me groups in trans-II are equivalent. The dipole moments 2.39 and 2.10 D. for the cis and trans isomers were consistent with the previously described structural assignments.

IT 14495-41-1

(Derived from data in the 6th Collective Formula Index (1957-1961))

RN 14495-41-1 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



L5 ANSWER 63 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1961:59429 CAPLUS

DOCUMENT NUMBER: 55:59429

ORIGINAL REFERENCE NO.: 55:11380b-d

TITLE: cis,cis,cis-1,2,3,4-Tetracarbomethoxycyclobutane;  
structure of  $\beta$ -heptacyclene

AUTHOR(S): Griffin, Gary W.; Veber, Daniel F.

CORPORATE SOURCE: Yale Univ.

SOURCE: Journal of the American Chemical Society (1960), 82,  
6417

CODEN: JACSAT; ISSN: 0002-7863

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

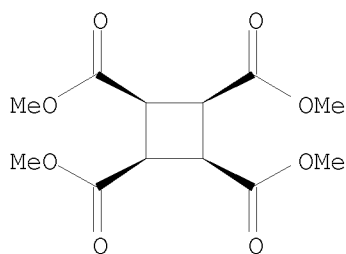
GI For diagram(s), see printed CA Issue.

AB cf. CA 54, 13019d.  $\beta$ -Heptacyclene I (cis, Ia) in 90% aqueous HOAc  
ozonized 17 hrs. at 25° with 3.66 g. O<sub>3</sub>/hr., the reaction mixture  
kept 3 days with 30% H<sub>2</sub>O<sub>2</sub> at room temperature, the solvents evaporated, the  
residue

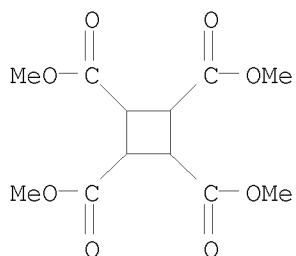
esterified with CH<sub>2</sub>N<sub>2</sub> and recrystd. from xylene gave a 5.6% yield of cis,cis,cis-1,2,3,4-tetracarbomethoxycyclobutane (II), m. 203-5°,  $\lambda$  3.34, 3.38, 5.72, 6.95, 8.34, 8.47, 9.31, 10.45, 12.00, 12.84  $\mu$ . Similarly  $\alpha$ -heptacyclene I (trans, III) gave cis,trans,cis-1,2,3,4-tetracarbomethoxycyclobutane (IV). Both II and IV in a sealed tube 20 hrs. at 300° could be isomerized to the all-trans tetraester. The infrared spectrum of II was identical to a totally esterified but otherwise uncharacterized minor product obtained from the irradiation of maleic anhydride in cyclohexane by Criegee. II was the last of the 4 possible tetracarbomethoxycyclobutanes to be synthesized.

IT 31351-41-4P  
 RL: SPN (Synthetic preparation); PRP (Properties); PREP (Preparation)  
 (cis,cis,cis-1,2,3,4-Tetracarbomethoxycyclobutane; structure of  $\beta$ -heptacyclene)  
 RN 31351-41-4 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\alpha$ ,4 $\alpha$ )- (9CI) (CA INDEX NAME)

Relative stereochemistry.



IT 14495-41-1, 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester  
 (stereoisomers)  
 RN 14495-41-1 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



L5 ANSWER 64 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 1961:59428 CAPLUS  
 DOCUMENT NUMBER: 55:59428  
 ORIGINAL REFERENCE NO.: 55:11379h-i,11380a-b  
 TITLE: The pyrolysis of fluorene  
 AUTHOR(S): Lang, Karl Friedrich; Buffleb, Herbert; Kalow, Joseph  
 CORPORATE SOURCE: Rutgerswerke Akt.-Ges., Castrop-Rauxel, Germany  
 SOURCE: Chemische Berichte (1961), 94, 523-6  
 CODEN: CHBEAM; ISSN: 0009-2940  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Unavailable

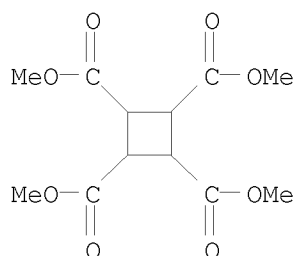
GI For diagram(s), see printed CA Issue.

AB The pyrolysis of fluorene (I) yielded 1,2:7,8-dibenzochrysene (II), a new hydrocarbon probably of the structure III, and rubicene (IV). I (4250 g.) pyrolyzed at 700-50° gave 3355 g. pyrolyzate which distilled gave unreacted I and left 645 g. black-brown residue; the residue dissolved in dry xylene and chromatographed on Al2O3 gave 128 g. II, needles, m. 214-15°, 48 g. III, needles, m. 288-9°, and 26 g. IV, red needles, m. 304-5° (xylene); in one run a small amount of a hydrocarbon, pale yellow needles, m. 437-45°, was also obtained; it was green in warm concentrated H2SO4. The ultraviolet absorption spectra of II, III, and IV were recorded.

IT 14495-41-1, 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester (stereoisomers)

RN 14495-41-1 CAPLUS

CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



L5 ANSWER 65 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1961:22472 CAPLUS

DOCUMENT NUMBER: 55:22472

ORIGINAL REFERENCE NO.: 55:4382c-i

TITLE: Cyclobutane-1,2,3,4-tetracarboxylic acid

AUTHOR(S): Criegee, Rudolf; Hover, Hermann

CORPORATE SOURCE: Tech. Hochschule, Karlsruhe, Germany

SOURCE: Chemische Berichte (1960), 93, 2521-4  
CODEN: CHBEAM; ISSN: 0009-2940

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

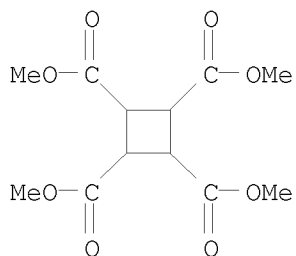
OTHER SOURCE(S): CASREACT 55:22472

GI For diagram(s), see printed CA Issue.

AB The ozone degradation of truxillic acids (I) yielded 3 of the 4 possible cyclobutane-1,2,3,4-tetracarboxylic acids (II). Powdered PhCH:CHCH:C(CO2H)2 (III) (100 g.) in 2 l. weakly acidic H2O stirred and irradiated 48 hrs. with an immersed ultraviolet lamp and filtered gave nearly 100% dimer (IV) of III, m. 195° (glacial AcOH). IV (100 g.) in 650 cc. glacial AcOH and 100 cc. H2O treated at -5 to 0° with 28-30 g. ozone (2.2-2.3 g./hr.) and then gradually with 750 cc. 10% H2O2 below 30° and kept 4-5 days gave 40-5 g. α-I, m. 274° (MeOH); in smaller runs the yield could be increased to about 75%. α-I (13.0 g.) in 600 cc. glacial AcOH and 100 cc. H2O treated 20 hrs. with 2.8 g. ozone/hr. then gradually with 270 cc. 10% H2O2 and evaporated after 2 days in vacuo below 40° gave 9.2 g. IVa, plates, m. about 240° with previous sintering (decomposition) (dioxane); tetra-Me ester (V), 90%, m. 145° (C6H6), from IIa with CH2N2 at 0°. IIa (4.0 g.) in 20 cc. Ac2O heated 0.5 hr. at 100-20°, cooled, and filtered yielded 2.52 g. dianhydride of IIa, turned brown above 300° without melting. γ-I (4.0 g.), m. 228° (aqueous EtOH), ozonized and treated with H2O2 in the usual manner yielded 80-90% IVb, m. 219°

(precipitated from glacial AcOH with Et<sub>2</sub>O), also obtained similarly from epi-I; tetra-Me ester, rodlets, m. 73-4° (petr. ether), b<sub>0.15</sub> 134-7°. ε-I, m. 192°, yielded in the same manner 80-90% Va, m. 260-4° (decomposition) (precipitated from hot glacial AcOH with ligroine); tetra-Me ester m. 127° (C<sub>6</sub>H<sub>6</sub>-petr. ether). V (3.0 g.) reduced at 30-40° with 2 g. LiAlH<sub>4</sub>, the noncryst. product in C<sub>5</sub>H<sub>5</sub>N treated at 0° with excess p-MeC<sub>6</sub>H<sub>4</sub>SO<sub>2</sub>Cl, kept 24 hrs. at room temperature, and poured into H<sub>2</sub>O yielded 3.0 g. VI (R = OH), melted with decomposition (hot aqueous EtOH). VI (16 g.) and 14 g. NaI refluxed 4 hrs., filtered, evaporated, and the product isolated with CHCl<sub>3</sub> yielded 7.0 g. VI (R = I), m. 140° (EtOAc-MeOH).

IT 14495-41-1P, 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester  
 RL: PREP (Preparation)  
 (preparation of)  
 RN 14495-41-1 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



L5 ANSWER 66 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1961:22471 CAPLUS

DOCUMENT NUMBER: 55:22471

ORIGINAL REFERENCE NO.: 55:4381h-i, 4382a-c

TITLE: Cyclopropanes. VII. The absolute configuration of trans-caronic and cis- and trans-umbellularic acids

AUTHOR(S): Walborsky, H. M.; Sugita, T.; Ohno, M.; Inouye, Y.

CORPORATE SOURCE: Florida State Univ., Tallahassee

SOURCE: Journal of the American Chemical Society (1960), 82, 5255-6

CODEN: JACSAT; ISSN: 0002-7863

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

GI For diagram(s), see printed CA Issue.

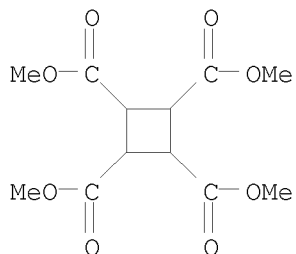
AB cf. CA 53, 16053a; 54, 15267a. Et diazoacetate (I) (0.042 mol) was added to 0.042 mol (-)-menthyl β,β-dimethylacrylate (II) at 130-40° and the mixture distilled to remove unreacted II, which was treated once more with an equivalent amount of I to yield 65% crude adduct.

The adduct was saponified to yield 27% caronic acid (III), [α]<sub>20D</sub> -5.05° (EtOH). The observed optical rotation corresponded to 15.9% asym. synthesis. To a xylene solution of dimethyldiazomethane was added 31.4 g. (-)-di-menthyl fumarate in xylene at 0-5° to yield 10.0 g. oil, which was heated with 1.0 g. Cu powder at 160-70° until N evolution ceased. The product distilled to yield 56% of adduct ester. Saponification yielded

25% trans-III, [α]<sub>20D</sub> 2.0° (EtOH), 6.3% asym. synthesis. I (5.0 g.) was added to 11.3 g. (-)-menthyl α-isopropylacrylate at 80° and maintained at that temperature until N evolution ceased. The addition product was saponified and the mixture of cis and trans acids separated to

give 14.7% cis-umbellularic acid (IV),  $[\alpha]_{16D} -5.4^\circ$  (CHCl<sub>3</sub>), 6% asym. synthesis. The trans-umbellularic acid (V) was isolated in 56.5% yield,  $[\alpha]_{16D} -5.2^\circ$  (acetone), 2.7% asym. synthesis. On the basis of the above asym. syntheses, the following absolute configurations were assigned to IV and V.

IT 14495-41-1P, 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester  
 RL: PREP (Preparation)  
 (preparation of)  
 RN 14495-41-1 CAPLUS  
 CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA INDEX NAME)



L5 ANSWER 67 OF 67 CAPLUS COPYRIGHT 2009 ACS on STN

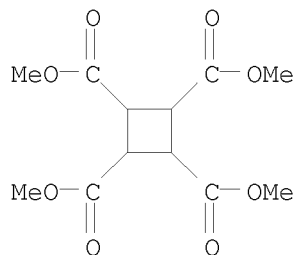
ACCESSION NUMBER: 1960:67951 CAPLUS  
 DOCUMENT NUMBER: 54:67951  
 ORIGINAL REFERENCE NO.: 54:13019d-h  
 TITLE: Photodimerization of maleic and fumaric acid derivatives  
 AUTHOR(S): Griffin, G. W.; Basinski, J. E.; Vellturo, A. F.  
 CORPORATE SOURCE: Yale Univ.  
 SOURCE: Tetrahedron Letters (1960), (No. 3), 13-16  
 CODEN: TELEAY; ISSN: 0040-4039  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Unavailable

GI For diagram(s), see printed CA Issue.

AB trans-(MeO<sub>2</sub>CCH:)<sub>2</sub> (I), trans-(NCCH:)<sub>2</sub> (II), and (OCCH:)<sub>2</sub> (III) were irradiated in the solid state with formation of the corresponding cyclobutane derivs. The olefins were deposited in a thin layer on the inner surface of a glass tube by evaporation of a CHCl<sub>3</sub> or Et<sub>2</sub>O solution, the layer irradiated 7-10 days by an internally located Westinghouse 15 T 8 Germicidal Sterilamp (95% ultraviolet radiation in the 253.7 mμ region), and the tube externally cooled with cold H<sub>2</sub>O. Irradiation of 10 g. I gave 2 g. 1,2,3,4-tetracarboxymethoxycyclobutane (IV), m. 144-5°, λ 5.74, 5.80, 7.72, 8.33, 9.79, 10.55, 11.85, 12.21 μ (KBr), nuclear magnetic resonance spectrum peaks at τ 6.15, 6.20 (CDCl<sub>3</sub>) in agreement with the structure assigned by Criegee. Treatment of (IV) with NaOMe in MeOH effected stereochem. equilibration and gave the all-trans ester, m. 127°. Irradiation of II 7 days and recrystn. of the Et<sub>2</sub>O-insol. material from MeCN gave 1,2,3,4-tetracyanocyclobutane, m. 237-9° (decomposition), λ 4.43, 3.35, 7.98, 8.25, 8.72, 9.72, 9.54, 9.64, 10.47, 12.22 μ, with the same stereo-chemistry as that of I (as shown by hydrolysis with HCl-AcOH and esterification with CH<sub>2</sub>N<sub>2</sub> to give I). Irradiation of III and sublimation of the product (m. above 200°) at 93°/0.005 mm. to remove III and at 200°/0.005 mm. gave a bisanhydride of 1,2,3,4-cyclobutanetetracarboxylic acid, λ 5.40, 5.62 μ.

IT 14495-41-1, 1,2,3,4-Cyclobutanetetracarboxylic acid, tetramethyl ester  
 (stereoisomers)

RN 14495-41-1 CAPLUS  
CN 1,2,3,4-Cyclobutanetetracarboxylic acid, 1,2,3,4-tetramethyl ester (CA  
INDEX NAME)



=>

=> file reg

COST IN U.S. DOLLARS

SINCE FILE

TOTAL

ENTRY

SESSION

FULL ESTIMATED COST

394.12

580.88

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)

SINCE FILE

TOTAL

ENTRY

SESSION

CA SUBSCRIBER PRICE

-54.94

-54.94

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DICTIONARY FILE UPDATES: 26 MAR 2009 HIGHEST RN 1127762-87-1

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L6 STRUCTURE UPLOADED

=> d 16

L6 HAS NO ANSWERS

L6 STR

\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

Structure attributes must be viewed using STN Express query preparation.

=> s 16

SAMPLE SEARCH INITIATED 16:56:39 FILE 'REGISTRY'

SAMPLE SCREEN SEARCH COMPLETED - 949 TO ITERATE

100.0% PROCESSED 949 ITERATIONS 1 ANSWERS

SEARCH TIME: 00.00.01

FULL FILE PROJECTIONS: ONLINE \*\*COMPLETE\*\*

BATCH \*\*COMPLETE\*\*

PROJECTED ITERATIONS: 17132 TO 20828

PROJECTED ANSWERS: 1 TO 80

L7 1 SEA SSS SAM L6

=> s 16 full

FULL SEARCH INITIATED 16:56:45 FILE 'REGISTRY'

FULL SCREEN SEARCH COMPLETED - 18908 TO ITERATE

100.0% PROCESSED 18908 ITERATIONS 11 ANSWERS

SEARCH TIME: 00.00.01

L8 11 SEA SSS FUL L6

=> file caplus

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	185.88	766.76

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE ENTRY	TOTAL SESSION
CA SUBSCRIBER PRICE	0.00	-54.94

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FILE COVERS 1907 - 27 Mar 2009 VOL 150 ISS 14

FILE LAST UPDATED: 26 Mar 2009 (20090326/ED)

Caplus now includes complete International Patent Classification (IPC) reclassification data for the third quarter of 2008.

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This file contains CAS Registry Numbers for easy and accurate

substance identification.

=> s 18

L9 11 L8

=> d 19 ibib abs hitstr 1-

YOU HAVE REQUESTED DATA FROM 11 ANSWERS - CONTINUE? Y/(N):y

L9 ANSWER 1 OF 11 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2005:232606 CAPLUS

DOCUMENT NUMBER: 142:309902

TITLE: The use of fumaric acid derivatives for treating cardiac insufficiency, and asthma

INVENTOR(S): Joshi, Rajendra Kumar; Strebel, Hans-Peter; Zaugg, Christian; Tamm, Michael

PATENT ASSIGNEE(S): Fumapharm A.-G., Switz.

SOURCE: PCT Int. Appl., 39 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005023241	A1	20050317	WO 2004-EP9835	20040903
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
DE 10360869	A1	20050407	DE 2003-10360869	20031223
AU 2004269903	A1	20050317	AU 2004-269903	20040903
CA 2526586	A1	20050317	CA 2004-2526586	20040903
EP 1663197	A1	20060607	EP 2004-764790	20040903
EP 1663197	B1	20071205		
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BR 2004010805	A	20060627	BR 2004-10805	20040903
CN 1829505	A	20060906	CN 2004-80021724	20040903
AT 380027	T	20071215	AT 2004-764790	20040903
RU 2313339	C2	20071227	RU 2005-141547	20040903
EP 1913942	A2	20080423	EP 2007-121903	20040903
EP 1913942	A3	20080521		
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ES 2297461	T3	20080501	ES 2004-764790	20040903
JP 2008529959	T	20080807	JP 2006-515290	20040903
NZ 543708	A	20081128	NZ 2004-543708	20040903
MX 2006002657	A	20060605	MX 2006-2657	20060308
US 20070027076	A1	20070201	US 2006-571241	20060309
NO 2006001340	A	20060324	NO 2006-1340	20060324
IN 2006KN00784	A	20080926	IN 2006-KN784	20060331
PRIORITY APPLN. INFO.:			DE 2003-10341530	A 20030909
			DE 2003-10360869	A 20031223
			EP 2004-764790	A3 20040903
			WO 2004-EP9835	W 20040903

OTHER SOURCE(S): MARPAT 142:309902

AB According to a first aspect the invention relates to the use of fumaric acid derivs. selected from the group consisting of dialkyl fumarates, monoalkyl hydrogen fumarates, fumaric acid monoalkyl ester salts, fumaric acid monoamides, monoamido fumaric acid salts, fumaric acid diamides, monoalkyl monoamido fumarates, carbocyclic and oxacarbo-cyclic oligomers of these compds. and mixts. thereof for preparing a drug for the treatment or prevention of cardiac insufficiency, in particular left ventricular insufficiency, myocardial infarction and angina pectoris. According to a second aspect the invention relates to the use of fumaric acid derivs., selected from the group consisting of dialkyl fumarates, monoalkyl hydrogen fumarates, fumaric acid monoalkyl ester salts, fumaric acid monoamido fumaric acid salts, fumaric acid diamides, monoalkyl monoamido fumarates, carbocyclic and oxacarbo-cyclic oligomers of these compds. and mixts. thereof for preparing a drug for the treatment of asthma and chronic obstructive pulmonary diseases, especially asthma caused by allergies, infections, analgesics, job conditions or phys. effort, mixed forms of asthma, or asthma cardiale.

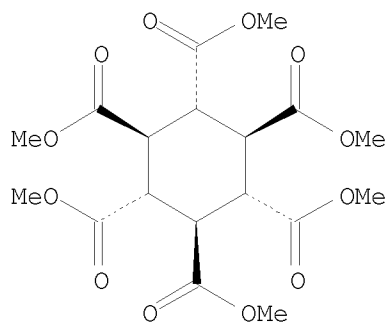
IT 94054-02-1

RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)  
(use of fumaric acid derivs. for treating cardiac failure, and asthma)

RN 94054-02-1 CAPLUS

CN 1,2,3,4,5,6-Cyclohexanehexacarboxylic acid, hexamethyl ester,  
(1 $\alpha$ ,2 $\beta$ ,3 $\alpha$ ,4 $\beta$ ,5 $\alpha$ ,6 $\beta$ )-(9CI) (CA INDEX  
NAME)

Relative stereochemistry.



REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 2 OF 11 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2003:837151 CAPLUS

DOCUMENT NUMBER: 139:328252

TITLE: Carbocyclic and oxacarbo-cyclic fumaric acid oligomers  
as pharmaceuticals

INVENTOR(S): Joshi, Rajendra Kumar; Strebel, Hans-Peter

PATENT ASSIGNEE(S): Fumapharm A.-G., Switz.

SOURCE: PCT Int. Appl., 28 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: German

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003087174	A2	20031023	WO 2003-EP3498	20030403
WO 2003087174	A3	20040108		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,

CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,  
 GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,  
 LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH,  
 PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ,  
 UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW  
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY,  
 KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES,  
 FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR,  
 BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

DE 10217314	A1	20031113	DE 2002-10217314	20020418
CA 2476298	A1	20031023	CA 2003-2476298	20030403
AU 2003216916	A1	20031027	AU 2003-216916	20030403
EP 1494992	A2	20050112	EP 2003-712131	20030403
EP 1494992	B1	20080528		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
JP 2005519982	T	20050707	JP 2003-584129	20030403
EP 1671965	A2	20060621	EP 2006-6969	20030403
EP 1671965	A3	20060726		
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NZ 534620	A	20070831	NZ 2003-534620	20030403
AT 396966	T	20080615	AT 2003-712131	20030403
US 20050148664	A1	20050707	US 2004-511564	20041015
PRIORITY APPLN. INFO.:				
			DE 2002-10217314	A 20020418
			EP 2003-712131	A3 20030403
			WO 2003-EP3498	W 20030403

OTHER SOURCE(S): MARPAT 139:328252

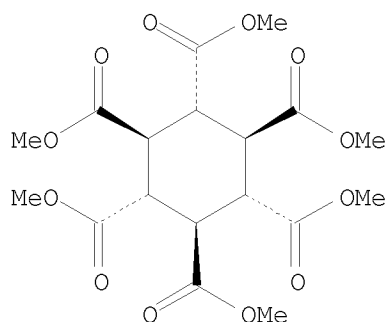
AB The title oligomers, with good hydrolysis resistance and useful in pharmaceuticals, are cyclic oligomers of fumaric acid or derivs. of specified structure. A homogenized (sieve 800) mixture of 6.0 kg r-1, t-2, c-3, t-4-tetrakis(methoxycarbonyl)cyclobutane and 3.0 kg r-1, t-2, c-3, t-4, c-5, t-6-hexa(methoxycarbonyl)cyclohexane was mixed (9.0 kg) with a starch derivative (STA-RX 1500) 18.0, microcryst. cellulose (Avicel PH 101) 0.30, poly(vinylpyrrolidone) (Kollidon 120) 0.75, Primogel 4.00, and colloidal SiO<sub>2</sub> (Aerosil) 0.25 kg was powdered to sieve 200, mixed with 2% aqueous Kollidon binder, dried, mixed with 0.50 kg Mg stearate and 1.50 kg talc, pressed to tablets, coated (for resistance to gastric juices) with a solution of 2.250 kg hydroxypropyl Me cellulose phthalate (Parmacoat HP 50) in acetone-EtOH-H<sub>2</sub>O, dried, and finish-coated.

IT 94054-02-1  
 RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)  
 (carbocyclic and oxacarbo-cyclic fumaric acid oligomers as pharmaceuticals)

RN 94054-02-1 CAPLUS

CN 1,2,3,4,5,6-Cyclohexanhexacarboxylic acid, hexamethyl ester,  
 (1 $\alpha$ , 2 $\beta$ , 3 $\alpha$ , 4 $\beta$ , 5 $\alpha$ , 6 $\beta$ )- (9CI) (CA INDEX  
 NAME)

Relative stereochemistry.



REFERENCE COUNT: 34 THERE ARE 34 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 3 OF 11 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1985:577814 CAPLUS

DOCUMENT NUMBER: 103:177814

ORIGINAL REFERENCE NO.: 103:28599a,28602a

TITLE: The behavior of stereoisomeric ions in the gas phase.  
2 - negative and positive chemical ionization of  
cyclohexanehexacarboxylic methyl esters

AUTHOR(S): Audisio, Guido; Grassi, Maria; Traldi, Piero; Daolio,  
Sergio

CORPORATE SOURCE: Ist. Chim. Macromol., Milan, 20133, Italy

SOURCE: Organic Mass Spectrometry (1985), 20(5), 327-30

CODEN: ORMSBG; ISSN: 0030-493X

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The pos. and neg. ion chemical ionization mass spectra of the title esters were studied. The rel. abundance of fragment ions at m/z 401 in the pos. ion spectra obtained for the esters studied is directly dependent on the trend of the different isomers to epimerize. A 3-step mechanism involves protonation, epimerization, and fragmentation.

IT 77117-51-2 83238-59-9 83861-33-0

94054-00-9 94054-01-0 94054-02-1

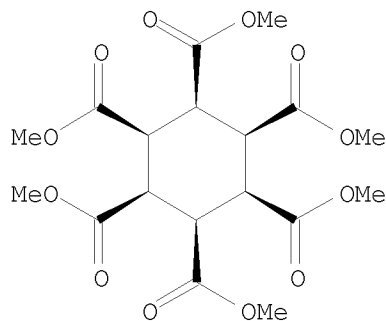
RL: PRP (Properties)

(neg. and pos. chemical ionization mass spectra of)

RN 77117-51-2 CAPLUS

CN 1,2,3,4,5,6-Cyclohexanehexacarboxylic acid, hexamethyl ester,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\alpha$ ,4 $\alpha$ ,5 $\alpha$ ,6 $\alpha$ )- (9CI) (CA INDEX  
NAME)

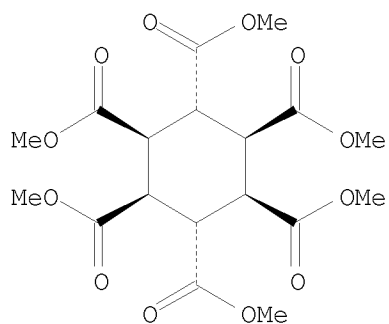
Relative stereochemistry.



RN 83238-59-9 CAPLUS

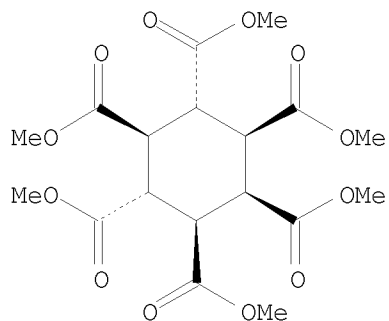
CN 1,2,3,4,5,6-Cyclohexanehexacarboxylic acid, hexamethyl ester,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\alpha$ ,5 $\alpha$ ,6 $\beta$ )- (9CI) (CA INDEX  
NAME)

Relative stereochemistry.



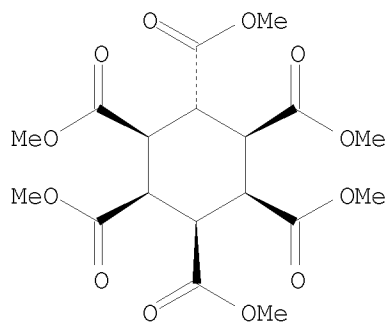
RN 83861-33-0 CAPLUS  
 CN 1,2,3,4,5,6-Cyclohexanhexacarboxylic acid, hexamethyl ester,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\alpha$ ,4 $\beta$ ,5 $\alpha$ ,6 $\beta$ )- (9CI) (CA INDEX  
 NAME)

Relative stereochemistry.



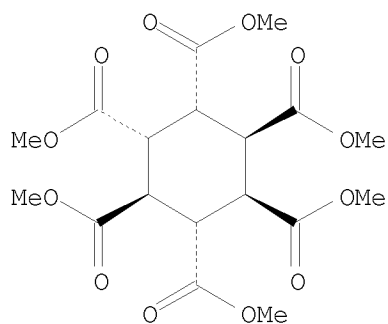
RN 94054-00-9 CAPLUS  
 CN 1,2,3,4,5,6-Cyclohexanhexacarboxylic acid, hexamethyl ester,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\alpha$ ,4 $\alpha$ ,5 $\alpha$ ,6 $\beta$ )- (9CI) (CA INDEX  
 NAME)

Relative stereochemistry.



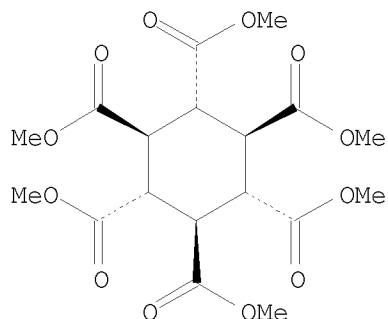
RN 94054-01-0 CAPLUS  
 CN 1,2,3,4,5,6-Cyclohexanhexacarboxylic acid, hexamethyl ester,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\alpha$ ,5 $\beta$ ,6 $\beta$ )- (9CI) (CA INDEX  
 NAME)

Relative stereochemistry.



RN 94054-02-1 CAPLUS  
 CN 1,2,3,4,5,6-Cyclohexanhexacarboxylic acid, hexamethyl ester,  
 (1 $\alpha$ ,2 $\beta$ ,3 $\alpha$ ,4 $\beta$ ,5 $\alpha$ ,6 $\beta$ )- (9CI) (CA INDEX  
 NAME)

Relative stereochemistry.



L9 ANSWER 4 OF 11 CAPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 1985:487249 CAPLUS  
 DOCUMENT NUMBER: 103:87249  
 ORIGINAL REFERENCE NO.: 103:14013a,14016a  
 TITLE: Stereochemical study of  
 1,2,3,4,5,6-(hexamethoxycarbonyl)cyclohexanes  
 AUTHOR(S): Farina, Mario; Grassi, Maria; Di Silvestro, Giuseppe  
 CORPORATE SOURCE: Dip. Chim. Org. Ind., Univ. Milano, Milan, I-20133,  
 Italy  
 SOURCE: Journal of the American Chemical Society (1985),  
 107(18), 5100-4  
 CODEN: JACSAT; ISSN: 0002-7863  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 OTHER SOURCE(S): CASREACT 103:87249  
 AB The cis, epi, myo, muco, chiro, and scyllo stereoisomers of the title  
 compound were prepared directly from bicyclooctene precursors or by  
 epimerization, their structure being ascertained by NMR anal. and by x-ray  
 anal. The stereochem. pathway of alkaline epimerization was found to be cis  
 $\rightarrow$  epi .dblarw. muco .dblarw. chiro .dblarw. myo .dblarw. scyllo. A  
 seventh compound, detected by gas chromatog. after a long reaction time, was  
 tentatively identified as neo. The most abundant isomer in the equilibrium  
 mixture at 25° is myo; however, if one considers the difference in  
 symmetry, the order of stability in terms of conformational energy is  
 scyllo > myo > chiro > muco. An interesting regioselective phenomenon was  
 observed during ozonolysis of a bicyclooctene precursor and was attributed to  
 the different stereochem. environment of the two unsatd. atoms involved in  
 the reaction.  
 IT 83238-59-9P 83861-33-0P 94054-00-9P

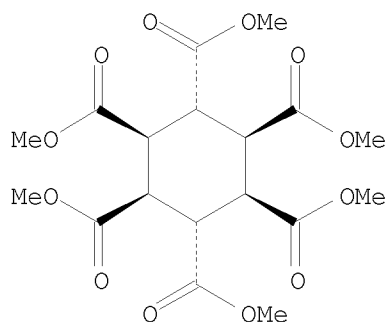
94054-01-0P 94054-02-1P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(preparation and NMR of)

RN 83238-59-9 CAPLUS

CN 1,2,3,4,5,6-Cyclohexanehexacarboxylic acid, hexamethyl ester,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\alpha$ ,5 $\alpha$ ,6 $\beta$ )- (9CI) (CA INDEX  
NAME)

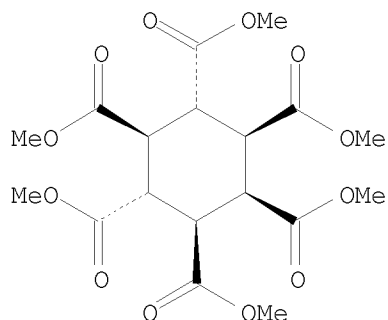
Relative stereochemistry.



RN 83861-33-0 CAPLUS

CN 1,2,3,4,5,6-Cyclohexanehexacarboxylic acid, hexamethyl ester,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\alpha$ ,4 $\beta$ ,5 $\alpha$ ,6 $\beta$ )- (9CI) (CA INDEX  
NAME)

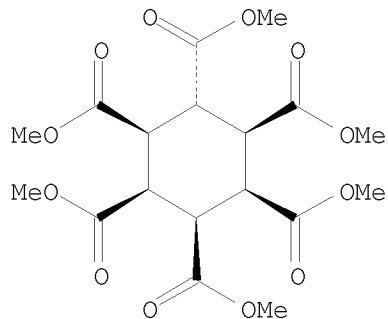
Relative stereochemistry.



RN 94054-00-9 CAPLUS

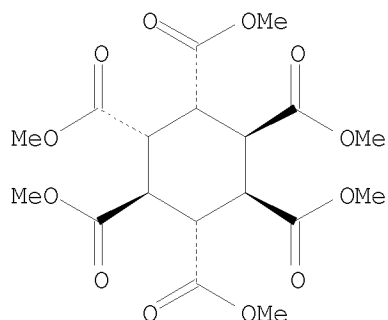
CN 1,2,3,4,5,6-Cyclohexanehexacarboxylic acid, hexamethyl ester,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\alpha$ ,4 $\alpha$ ,5 $\alpha$ ,6 $\beta$ )- (9CI) (CA INDEX  
NAME)

Relative stereochemistry.



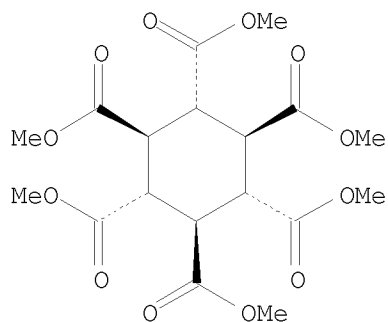
RN 94054-01-0 CAPLUS  
 CN 1,2,3,4,5,6-Cyclohexanehexacarboxylic acid, hexamethyl ester,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\alpha$ ,5 $\beta$ ,6 $\beta$ )- (9CI) (CA INDEX  
 NAME)

Relative stereochemistry.



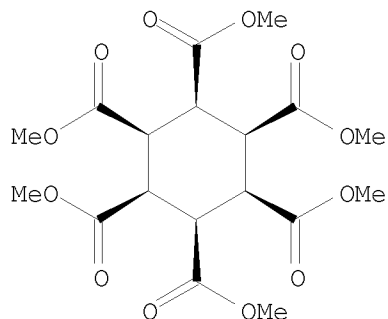
RN 94054-02-1 CAPLUS  
 CN 1,2,3,4,5,6-Cyclohexanehexacarboxylic acid, hexamethyl ester,  
 (1 $\alpha$ ,2 $\beta$ ,3 $\alpha$ ,4 $\beta$ ,5 $\alpha$ ,6 $\beta$ )- (9CI) (CA INDEX  
 NAME)

Relative stereochemistry.



IT 77117-51-2P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (preparation, epimerization, and NMR of)  
 RN 77117-51-2 CAPLUS  
 CN 1,2,3,4,5,6-Cyclohexanehexacarboxylic acid, hexamethyl ester,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\alpha$ ,4 $\alpha$ ,5 $\alpha$ ,6 $\alpha$ )- (9CI) (CA INDEX  
 NAME)

Relative stereochemistry.



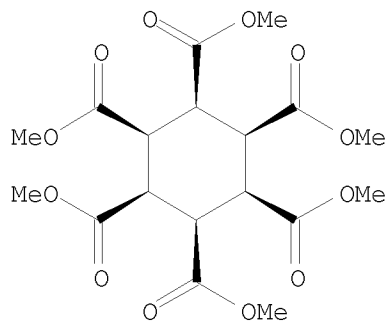
ACCESSION NUMBER: 1985:23948 CAPLUS  
 DOCUMENT NUMBER: 102:23948  
 ORIGINAL REFERENCE NO.: 102:3935a,3938a  
 TITLE: The behavior of stereoisomeric ions in the gas phase:  
 the case of cyclohexanehexacarboxylic methyl esters  
 AUTHOR(S): Audisio, Guido; Grassi, Maria; Daolio, Sergio; Traldi,  
 Pietro  
 CORPORATE SOURCE: Ist. Chim. Macromol., CNR, Milan, 20133, Italy  
 SOURCE: Organic Mass Spectrometry (1984), 19(5), 221-6  
 CODEN: ORMSBG; ISSN: 0030-493X  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB Not only strong differences in relative abundances of product ions, but  
 also different fragmentation paths are observed in the electron impact mass  
 spectroscopy of 6 stereoisomeric cyclohexanehexacarboxylic Me esters.  
 This unusual behavior was studied using different ionization methods, B/E  
 and B2/E linked scans, exact mass measurements, D labeling expts., and  
 collisionally activated decomposition spectrometry. A close analogy between  
 the isomerization observed under acidic conditions in condensed phase and  
 that observed under chemical ionization (CH4) conditions is underlined.

IT 77117-51-2 83238-59-9 83861-33-0  
 94054-00-9 94054-01-0 94054-02-1  
 RL: PRP (Properties)  
 (mass spectrum of, electron-impact)

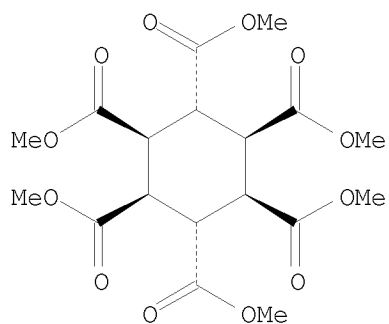
RN 77117-51-2 CAPLUS  
 CN 1,2,3,4,5,6-Cyclohexanehexacarboxylic acid, hexamethyl ester,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\alpha$ ,4 $\alpha$ ,5 $\alpha$ ,6 $\alpha$ )- (9CI) (CA INDEX  
 NAME)

Relative stereochemistry.



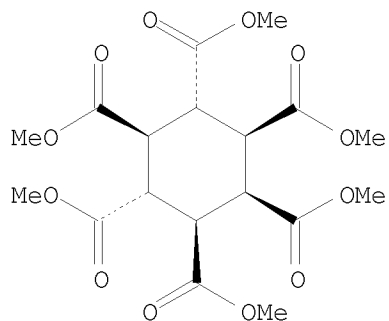
RN 83238-59-9 CAPLUS  
 CN 1,2,3,4,5,6-Cyclohexanehexacarboxylic acid, hexamethyl ester,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\alpha$ ,5 $\alpha$ ,6 $\beta$ )- (9CI) (CA INDEX  
 NAME)

Relative stereochemistry.



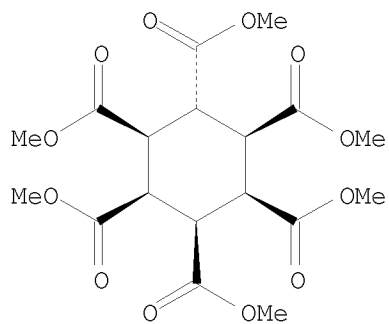
RN 83861-33-0 CAPLUS  
 CN 1,2,3,4,5,6-Cyclohexanhexacarboxylic acid, hexamethyl ester,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\alpha$ ,4 $\beta$ ,5 $\alpha$ ,6 $\beta$ )- (9CI) (CA INDEX  
 NAME)

Relative stereochemistry.



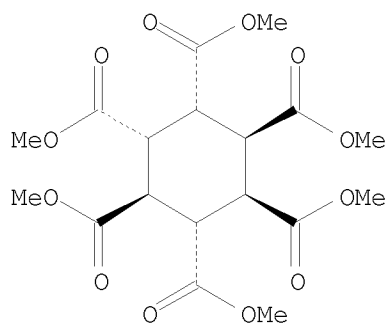
RN 94054-00-9 CAPLUS  
 CN 1,2,3,4,5,6-Cyclohexanhexacarboxylic acid, hexamethyl ester,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\alpha$ ,4 $\alpha$ ,5 $\alpha$ ,6 $\beta$ )- (9CI) (CA INDEX  
 NAME)

Relative stereochemistry.



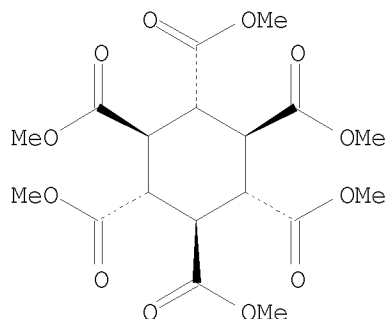
RN 94054-01-0 CAPLUS  
 CN 1,2,3,4,5,6-Cyclohexanhexacarboxylic acid, hexamethyl ester,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\alpha$ ,5 $\beta$ ,6 $\beta$ )- (9CI) (CA INDEX  
 NAME)

Relative stereochemistry.



RN 94054-02-1 CAPLUS  
 CN 1,2,3,4,5,6-Cyclohexanhexacarboxylic acid, hexamethyl ester,  
 (1 $\alpha$ , 2 $\beta$ , 3 $\alpha$ , 4 $\beta$ , 5 $\alpha$ , 6 $\beta$ )- (9CI) (CA INDEX  
 NAME)

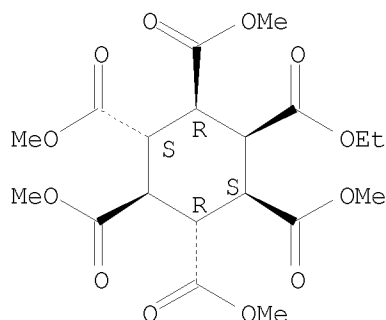
Relative stereochemistry.



L9 ANSWER 6 OF 11 CAPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 1982:627952 CAPLUS  
 DOCUMENT NUMBER: 97:227952  
 ORIGINAL REFERENCE NO.: 97:38019a,38022a  
 TITLE: Crystal structures of:  
 r-1,c-2,t-3,c-4,t-5,c-6-  
 hexamethoxycarbonylcyclohexane, C<sub>18</sub>H<sub>24</sub>O<sub>12</sub>,  
 r-1-ethoxycarbonyl,c-2,t-3,c-4,t-5,c-6-  
 pentamethoxycarbonylcyclohexane, C<sub>19</sub>H<sub>26</sub>O<sub>12</sub>  
 AUTHOR(S): Brueckner, S.; Malpezzi, L.; Grassi, M.  
 CORPORATE SOURCE: Ist. Chim., Politec. Milano, Milan, 20133, Italy  
 SOURCE: Crystal Structure Communications (1982), 11(3), 1043-8  
 CODEN: CSCMCS; ISSN: 0302-1742  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB Hexamethoxycarbonylcyclohexane is orthorhombic, space group Pbca, with a  
 15.236(3), b 14.935(3), and c 18.986(4) Å; d.(calculated) = 1.328 for Z =  
 8; final R = 0.049. (Ethoxycarbonyl)pentamethoxycarbonylcyclohexane is  
 monoclinic, space group P2<sub>1</sub>/c, with a 9.278(2), b 22.802(4), c 11.564(3)  
 Å, and  $\beta$  112.70(3)°; d.(calculated) = 1.35 for Z = 4; final R  
 = 0.56. Atomic parameters are given. Substitution of a Me group with an Et  
 group in the ester residue axially connected to the cyclohexane ring does  
 not involve significantly different intramol. interactions. The most  
 relevant difference concerns the orientation of the carbomethoxy group  
 connected to the cyclohexane ring through the C(5)-C(O) bond.  
 IT 83834-82-6 83861-33-0  
 RL: PRP (Properties)  
 (crystal structure of)  
 RN 83834-82-6 CAPLUS

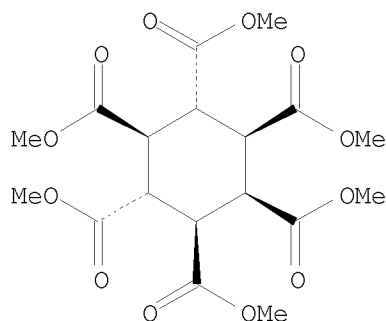
CN 1,2,3,4,5,6-Cyclohexanehexacarboxylic acid, ethyl pentamethyl ester,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\alpha$ ,5 $\beta$ ,6 $\alpha$ )- (9CI) (CA INDEX  
NAME)

Relative stereochemistry.

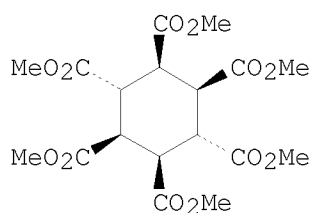


RN 83861-33-0 CAPLUS  
CN 1,2,3,4,5,6-Cyclohexanehexacarboxylic acid, hexamethyl ester,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\alpha$ ,4 $\beta$ ,5 $\alpha$ ,6 $\beta$ )- (9CI) (CA INDEX  
NAME)

Relative stereochemistry.



L9 ANSWER 7 OF 11 CAPLUS COPYRIGHT 2009 ACS on STN  
ACCESSION NUMBER: 1982:561924 CAPLUS  
DOCUMENT NUMBER: 97:161924  
ORIGINAL REFERENCE NO.: 97:26997a,27000a  
TITLE: Ring inversion of  
muco-1,2,3,4,5,6-hexakis(methoxycarbonyl)cyclohexane  
AUTHOR(S): Gatti, Giuseppe; Grassi, Maria; Di Silvestro, Giuseppe  
CORPORATE SOURCE: Ist. Chim. Macromol., Milan, I-20133, Italy  
SOURCE: Journal of Chemical Research, Synopses (1982), (7),  
196  
CODEN: JRPSDC; ISSN: 0308-2342  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
GI



AB The title compound (I) was prepared by epimerization of the corresponding *cis* ester (II) with NaOMe in refluxing MeOH and by sequential ozonolysis, oxidation, and esterification of 5,7-*exo*-6,8-*endo*-tetrakis(methoxycarbonyl)bicyclo[2.2.2]oct-2-ene. <sup>13</sup>C NMR study of I at -64 to +20° gave activation parameters  $\Delta H^* = 11.79$ ,  $\Delta G^*(25^\circ) = 12.14$  kcal/mol and  $\Delta S^* = -1.2$  cal/K/mol for ring inversion. The free-energy barrier to activation is considerably lower than for II (16.7 kcal/mol), owing to a decrease in the energy of the transition state due to smaller nonbonded interactions between substituents.

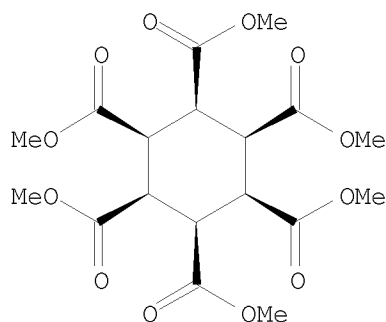
IT 77117-51-2

RL: RCT (Reactant); RACT (Reactant or reagent)  
(epimerization of)

RN 77117-51-2 CAPLUS

CN 1,2,3,4,5,6-Cyclohexanhexacarboxylic acid, hexamethyl ester,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\alpha$ ,4 $\alpha$ ,5 $\alpha$ ,6 $\alpha$ )- (9CI) (CA INDEX  
NAME)

Relative stereochemistry.



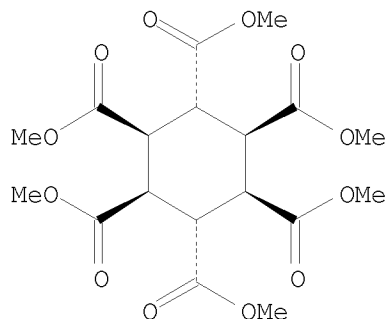
IT 83238-59-9P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation and conformational inversion of, potential barrier to)

RN 83238-59-9 CAPLUS

CN 1,2,3,4,5,6-Cyclohexanhexacarboxylic acid, hexamethyl ester,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\alpha$ ,5 $\alpha$ ,6 $\beta$ )- (9CI) (CA INDEX  
NAME)

Relative stereochemistry.



L9 ANSWER 8 OF 11 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1982:405471 CAPLUS

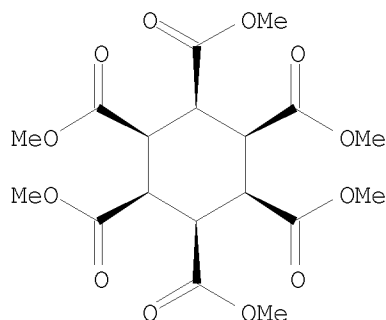
DOCUMENT NUMBER: 97:5471

ORIGINAL REFERENCE NO.: 97:1067a,1070a

TITLE: Ring reversal of

cis-cyclohexane-1,2,3,4,5,6-hexacarboxylic acid and  
 its hexamethyl ester  
 AUTHOR(S): Gatti, Giuseppe; Grassi, Maria; Di Silvestro,  
 Giuseppe; Farina, Mario; Bruckner, Sergio  
 CORPORATE SOURCE: Inst. Chim. Macromol., CNR, Milan, 1-20133, Italy  
 SOURCE: Journal of the Chemical Society, Perkin Transactions  
 2: Physical Organic Chemistry (1972-1999) (1982),  
 (3), 255-8  
 CODEN: JCPKBH; ISSN: 0300-9580  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB NMR studies showed that the title compds. (I and II, resp.) exist in solution  
 at room temperature as an equilibrium of slowly exchanging chair  
 conformations. The  
 activation parameters were determined from complete line-shape anal. of the <sup>13</sup>C  
 NMR spectra measured at different temps. A relatively high value  
 (.apprx.17 kcal/mol) of the free energy of activation was found for both I  
 and II. The energy barrier of the acid was calculated by mol. mechanics and  
 the computer program MOLBD3. The value obtained (16 kcal/mol) is a slight  
 overest., by comparison with the observed value of 13-14.5 kcal/mol.  
 IT 77117-51-2  
 RL: PRP (Properties)  
 (conformational inversion of, NMR and theor. study of)  
 RN 77117-51-2 CAPLUS  
 CN 1,2,3,4,5,6-Cyclohexanehexacarboxylic acid, hexamethyl ester,  
 (1 $\alpha$ ,2 $\alpha$ ,3 $\alpha$ ,4 $\alpha$ ,5 $\alpha$ ,6 $\alpha$ )- (9CI) (CA INDEX  
 NAME)

Relative stereochemistry.

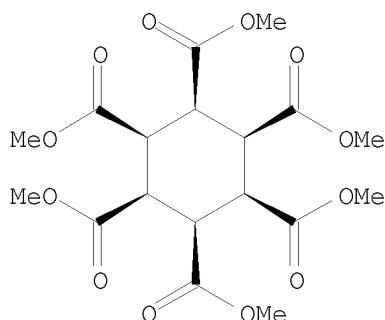


L9 ANSWER 9 OF 11 CAPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 1981:148672 CAPLUS  
 DOCUMENT NUMBER: 94:148672  
 ORIGINAL REFERENCE NO.: 94:24177a,24180a  
 TITLE: The structure of  
 1,2,3,4,5,6-cis-cyclohexanehexacarboxylic acid and its  
 hexamethyl ester  
 AUTHOR(S): Brueckner, Sergio; Giunchi, Luciana Malpezzi; Di  
 Silvestro, Giuseppe; Grassi, Maria  
 CORPORATE SOURCE: Ist. Chim., Politec. Milano, Milan, 20133, Italy  
 SOURCE: Acta Crystallographica, Section B: Structural  
 Crystallography and Crystal Chemistry (1981), B37(3),  
 586-90  
 CODEN: ACBCAR; ISSN: 0567-7408  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB C<sub>12</sub>H<sub>12</sub>O<sub>12</sub>·3H<sub>2</sub>O is orthorhombic, space group P2<sub>1</sub>2<sub>1</sub>2<sub>1</sub>, with a 13.44(1), b  
 11.18(1), c 10.37(1) Å; Z = 4; final R = 0.055. C<sub>18</sub>H<sub>24</sub>O<sub>12</sub> is  
 orthorhombic, space group Pbca, with a 34.79(3), b 20.63(2), and c

11.58(1) Å; Z = 8 (2 mols./Z); final R = 0.059. A comparison is drawn between observed geometries and data calculated for a model mol. by the use of the mol.-mechanics method.

IT 77117-51-2  
RL: PRP (Properties)  
(structure of)  
RN 77117-51-2 CAPLUS  
CN 1,2,3,4,5,6-Cyclohexanehexacarboxylic acid, hexamethyl ester,  
(1 $\alpha$ ,2 $\alpha$ ,3 $\alpha$ ,4 $\alpha$ ,5 $\alpha$ ,6 $\alpha$ )- (9CI) (CA INDEX  
NAME)

Relative stereochemistry.



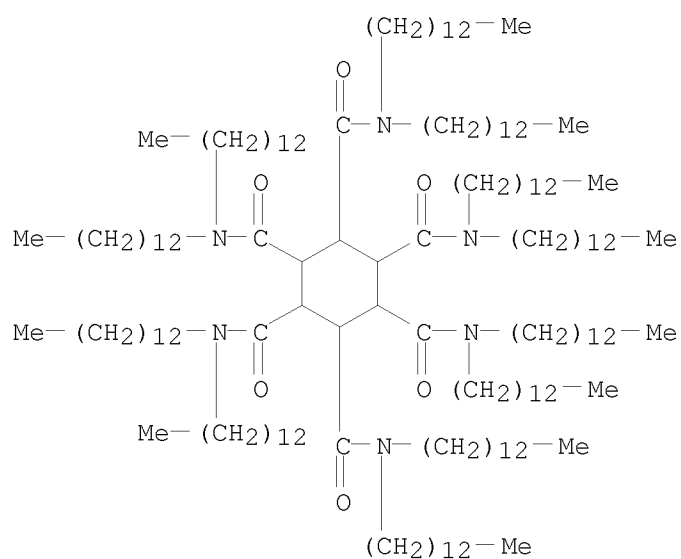
L9 ANSWER 10 OF 11 CAPLUS COPYRIGHT 2009 ACS on STN  
ACCESSION NUMBER: 1976:92567 CAPLUS  
DOCUMENT NUMBER: 84:92567  
ORIGINAL REFERENCE NO.: 84:15113a,15116a  
TITLE: Use of amides of cyclic polycarboxylic acids as motor  
fuel additives  
INVENTOR(S): Nottes, Guenther; Nohe, Heinz  
PATENT ASSIGNEE(S): BASF A.-G., Fed. Rep. Ger.  
SOURCE: Ger. Offen., 13 pp. Addn. to Ger. Offen. 2,256,690.  
CODEN: GWXXBX  
DOCUMENT TYPE: Patent  
LANGUAGE: German  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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DE 2417788	A1	19751030	DE 1974-2417788	19740411

PRIORITY APPLN. INFO.: DE 1974-2417788 19740411

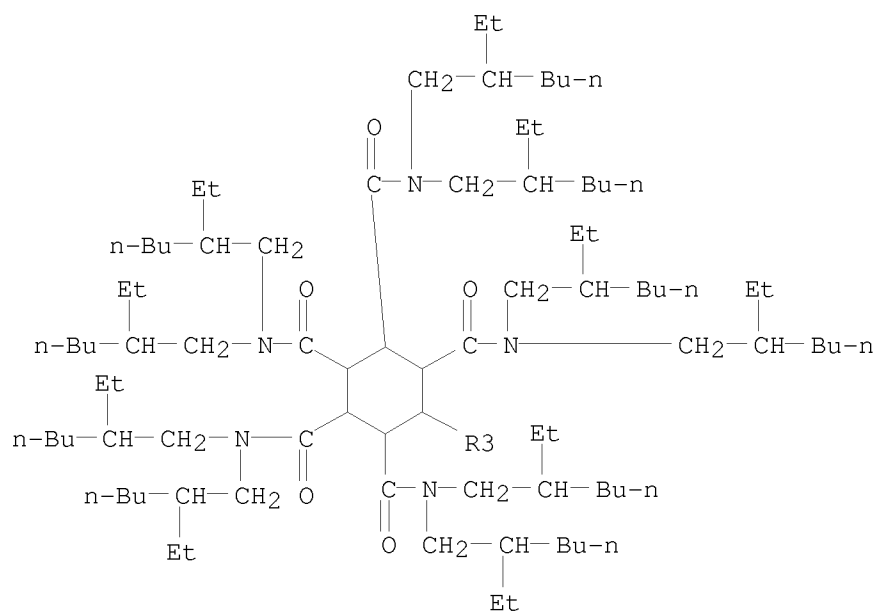
AB Cyclic polycarboxylic acid amides were prepared and used as gasoline additives. Thus, 248 parts bicyclooctenetetracarboxylic dianhydride [1719-83-1] in DMF at 60° was treated with 258 parts 2-ethylhexylamine [104-75-6], and the mixture was heated 8 hrs at 140-50° to yield 97% bicyclooctenetetracarboxylic acid bis(2-ethylhexylimide) (I) [58365-41-6]. Carburetor and inlet valves in motors tested with fuels containing I remained clean with no increase in CO emission.

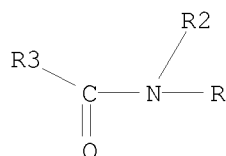
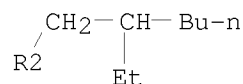
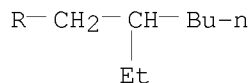
IT 58365-45-0P 58403-36-4P  
RL: PREP (Preparation)  
(manufacture of, as gasoline additives)  
RN 58365-45-0 CAPLUS  
CN 1,2,3,4,5,6-Cyclohexanehexacarboxamide,  
N1,N1,N2,N2,N3,N3,N4,N4,N5,N5,N6,N6-dodecatridecyl- (CA INDEX NAME)



RN 58403-36-4 CAPLUS  
 CN 1,2,3,4,5,6-Cyclohexanhexacarboxamide,  
 N1,N1,N2,N2,N3,N3,N4,N4,N5,N5,N6,N6-dodecakis(2-ethylhexyl)- (CA INDEX  
 NAME)

PAGE 1-A





L9 ANSWER 11 OF 11 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1975:46236 CAPLUS

DOCUMENT NUMBER: 82:46236

ORIGINAL REFERENCE NO.: 82:7351a,7354a

TITLE: Fuel for gasoline engines, containing nonaromatic cyclic carboxylic acid ester

INVENTOR(S): Nottes, Guenter; Nohe, Heinz

PATENT ASSIGNEE(S): BASF A.-G.

SOURCE: Ger., 4 pp.

CODEN: GWXXAW

DOCUMENT TYPE: Patent

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PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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DE 2304068	B1	19740606	DE 1973-2304068	19730127
DE 2304068	C2	19750130		
DE 2316535	A1	19741024	DE 1973-2316535	19730403
NL 7315694	A	19740521	NL 1973-15694	19731115
CA 1019571	A1	19771025	CA 1973-185873	19731115
FR 2207180	A1	19740614	FR 1973-40906	19731116
SU 466666	A3	19750405	SU 1973-1970238	19731116
AT 7309660	A	19750615	AT 1973-9660	19731116
AT 328600	B	19760325		
SE 383161	B	19760301	SE 1973-15568	19731116
IT 1001797	B	19760430	IT 1973-31411	19731116
GB 1442143	A	19760707	GB 1973-53221	19731116
BE 807489	A1	19740520	BE 1973-137895	19731119
JP 49081408	A	19740806	JP 1973-129287	19731119
JP 51039963	B	19761030		

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DE 1973-2304068 A 19730127  
DE 1973-2316535 A 19730403

AB Additives like tetrakis(2-ethylhexyl) bicyclooctenetetracarboxylate [53525-50-1] and hexakis(2-ethylhexyl) cyclohexanehexacarboxylate (I) [53602-55-4] prevent formation of deposits on carburetors and therefore decrease the amount of CO in the exhaust. Thus, in a 1-cylinder test motor, run for 50 hr with fuel containing 500 ppm I, no deposits formed, corresponding to a demerit value of 10 on a 0-10 scale, whereas fuel containing 1000 ppm dioctyl phthalate rated 1. In an idling Fiat 600 D motor,

run with fuel containing 100 ppm I, CO output had not increased after 100 hr, whereas CO output increased from 3.7-4.4 to 7.1% within 50 hr when the fuel contained no I.

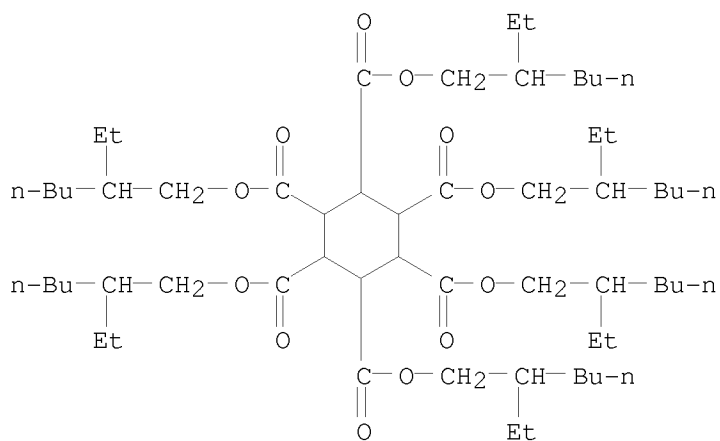
IT 53602-55-4 53667-52-0

RL: USES (Uses)

(gasoline detergent)

RN 53602-55-4 CAPLUS

CN 1,2,3,4,5,6-Cyclohexanehexacarboxylic acid,  
1,2,3,4,5,6-hexakis(2-ethylhexyl) ester (CA INDEX NAME)



RN 53667-52-0 CAPLUS

CN 1,2,3,4,5,6-Cyclohexanehexacarboxylic acid,  
1,2,3,4,5,6-hexakis(1-methylpropyl) ester (CA INDEX NAME)

